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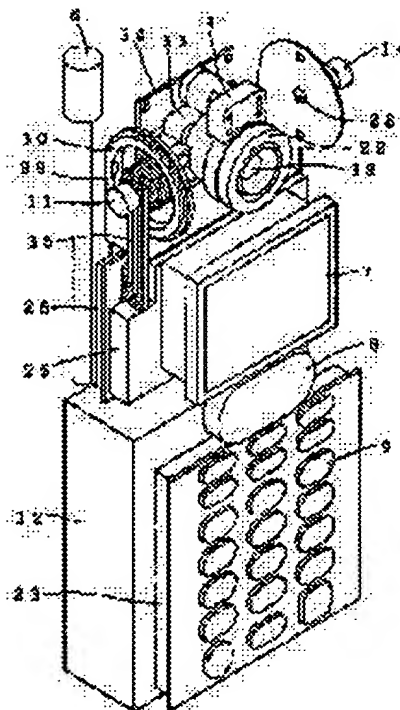
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## (54) PORTABLE IMAGE PICKUP DEVICE OR ITS IMAGE PICKUP ELEMENT

## (57)Abstract:

PURPOSE: To erect an inverted image caused when a video camera is turned around by 180° in the horizontal direction and its upside is set down.

CONSTITUTION: An erected or inverted read means is provided to an image pickup element 33 of a video camera 22 to detect a posture of the video camera 22 and to provide the erected or inverted read means for the image pickup element 33. When the image pickup element 33 is a CCD image sensor, a horizontal transfer CCD is provided to an upper or lower part of a photo diode as the erected or inverted read means. In the case of MOS image sensor, a switch selecting a scanning direction of a vertical shift register is provided as the erected or inverted read means. Since the erected or inverted read means is provided to the image pickup element 33, an erected image is easily obtained without turning a case. That is, since the erected image read means and the inverted image read means are selected according to an angular position of the video camera 22, the erected image is obtained automatically and recording of an inverted image is prevented onto a recording device such as a VTR.



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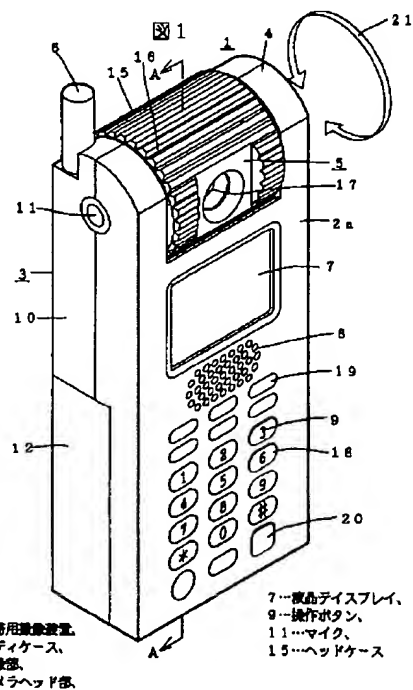
(54) 【発明の名称】 携帯用撮像装置またはその撮像素子

## (57) 【要約】

【目的】ビデオカメラが水平方向軸回りに180度回転して倒立状態となった時に発生する倒立像を正立化する。

【構成】ビデオカメラの撮像素子に正立または倒立読み出し手段を設け、ビデオカメラの姿勢を検出して、撮像素子に正立または倒立読み出し手段を切り替える。撮像素子がCCDイメージセンサの場合は正立または倒立読み出し手段としてフォトダイオードの上部または下部にそれぞれ水平転送CCDを設ける。MOSイメージセンサの場合は正立または倒立読み出し手段として垂直シフトレジスタの走査方向を切り替えるスイッチを設ける。

【効果】撮像素子に正立または倒立読み出し手段を設けたので、筐体を回転させなくとも容易に正立像を得ることができる。すなわち、ビデオカメラの角度位置に従って正立像読み出し手段と倒立像読み出し手段とを切り替えるので、自動的に正立像とすることができ、VTR等の記録機器に誤って倒立像を記録することが防止できる。



## 【特許請求の範囲】

【請求項1】映像表示手段を内蔵した筐体と、該映像表示手段によって一義的に定まる該筐体の水平方向の軸を中心に回転可能に軸支されたビデオカメラと、を備えた携帯用撮像装置において、

上記筐体には上記ビデオカメラの該筐体に対する回転角度位置に対応した位置検出手段を有し、上記ビデオカメラは撮像素子を有し、該撮像素子は正立像読み出し手段と共に倒立像読み出し手段とを有し、上記信号検出手段の信号にしたがって、上記撮像素子の上記正立像読み出し手段と上記倒立像読み出し手段とを切り替えることを特徴とする携帯用撮像装置。

【請求項2】上記撮像素子がCCDイメージ・センサーであって、上記正立像読み出し手段または上記倒立像読み出し手段が、垂直転送CCDおよびフォト・ダイオードの上部または下部に設けられた水平転送CCDであることを特徴とする請求項1に記載の携帯用撮像装置。

【請求項3】上記撮像素子がMOS型イメージ・センサーであって、上記正立像読み出し手段または上記倒立像読み出し手段が、該MOS型イメージ・センサーの垂直走査シフトレジスタの走査方向切り替え手段であって、上記信号検出手段の信号にしたがって、上記垂直走査シフトレジスタの走査方向を切り替えることを特徴とする請求項1に記載の携帯用撮像装置。

【請求項4】フォト・ダイオードと、垂直転送CCDと、該フォト・ダイオードおよび該垂直転送CCDの上部および下部に設けられた一組の水平転送CCDとから構成されたCCDイメージ・センサーであることを特徴とする撮像素子。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】本発明は、映像撮影装置としてビデオカメラを、映像表示装置として直視型の平面ディスプレイを備えた携帯用撮像装置にかかり、特に撮影者が平面ディスプレイでモニターしながらビデオカメラの角度を調節して被写体を撮影する携帯用撮像装置に関する。この種の携帯用撮像装置としてはVTR一体型ビデオカメラや、固体メモリーやビデオフロッピーを有する電子スチルカメラ等が有る。

【0002】また、新しくは、カメラ一体型携帯端末(PDA: Personal Data Assistant)やカメラ一体型携帯電話等を提案するものである。

## 【0003】

【従来の技術】従来この種の携帯用撮像装置としては、特公平4-6154号に開示の「モニターTV付きカメラ一体型VTR」がある。特公平4-6154号に開示の撮像装置はVTR部とモニターTV部を筐体に納めて一体として構成し、ビデオカメラ部を筐体の右側面のほぼ中央部分に水平方向軸を中心に回転可能に軸支したも

のである。このカメラ一体型VTRは右手で装置全体を支えるか、あるいは左手で筐体を持ってモニター部が撮影者に正対(モニター部の平面に対して撮影者の視線が垂直に)するように保持し、右手でビデオカメラ部を持って、このビデオカメラ部をモニター部に対してひねることによってビデオカメラの傾き変えて被写体を撮影するものである。

【0004】また、星川悦男他「高画質MSムービーVLE-HL1」(シャープ技報第54号・1992年11月pp67~70)には、左側にVTRと液晶ディスプレイを一体にし、両者を互いに回転可能に軸支した撮像装置が掲載されている。

【0005】これらのタイプの撮像装置は、ビデオカメラ部を180度回転させてモニター部と同じ方向に向けることが可能であり、撮影者が自分自身を撮影することができた。一般に、ビデオカメラは撮影者の前方にある被写体を撮影する場合に天地が正常に撮影されるようにセットされている。したがって、ビデオカメラを水平軸を中心に180度回転させてビデオカメラを倒立にすると、表示映像または記録映像は倒立映像が表示または記録されることになる。そこでこれらのタイプの撮像装置を用いて天地正常な記録映像(正立映像)を得るためには、まずビデオカメラを撮影者自身に向け(ビデオカメラは正立)、次いでモニターを水平軸を中心に180度回転(モニターは倒立)させて撮影者自身に向ける方法が採用されている。この時、モニターの表示が倒立像となるので、モニターの垂直方向走査を反転させて正立映像を得ていた。

## 【0006】

【発明が解決しようとする課題】上記従来例は、モニターの垂直方向走査を反転させて正立像を得る方式なので、ビデオカメラがモニター表示画面側に向いた時は、ビデオカメラの正立または倒立のいかにかわらず、いつでもモニターには正立映像が表示される。すなわち、ビデオカメラを正立状態に保持しモニター側を倒立させてもモニターの垂直走査方向が反転するのでモニターには正立映像が表示され、反対にビデオカメラを倒立状態に保持してモニター側を正立させてもビデオカメラの倒立映像入力にモニターで上下反転されて正立映像が表示される。つまり、ビデオカメラ側を倒立しても、また反対にモニター側を倒立しても、モニターには常に天地正常な映像が表示されることになる。従って、モニターに表示された映像を見ているだけでは、撮影者にはビデオカメラを倒立したら良いのか、あるいはモニターを倒立したら良いのか判断できない。VTR等の記録機器にはビデオカメラの撮影映像がそのまま記録されるから、常に正立映像を記録するためにはビデオカメラを正立させ、モニターは倒立することが正しい。しかしながら、撮影時には、通常、モニター画面は撮影者に対して正対するように保持され、ビデオカメラの角度を変えて

被写体を追尾する使用方法である。したがって、撮影者自身を撮影する場合にも、その延長と考えると、モニターをそのまま保持し、ビデオカメラ自体を180度回転して倒立させて撮影する場合が発生する。この場合、記録機器には倒立映像が記録されてしまうという問題があった。

【0007】また、本発明のように、カメラ一体型携帯端末(PDA)やカメラ一体型携帯電話等では映像表示側筐体に電話番号操作ボタンが配置され、モニターには文字が表示されるため、モニターを倒立して使用することができない。そこで、ビデオカメラが倒立した時に、倒立映像を正立化する必要が生じて来る。

【0008】

【課題を解決するための手段】上記従来例や新提案製品の課題を解決するために、筐体内にビデオカメラがモニター側に向けたことを検出する位置検出手段を設け、またビデオカメラは正立読み出し手段と共に倒立読み出し手段を有する撮像素子から構成した。

【0009】具体的には、撮像素子がCCDイメージ・センサーである場合は、正立読み出し手段または倒立読み出し手段が垂直転送CCDおよびフォト・ダイオードの上部または下部に設けられた一組の水平転送CCDである。

【0010】また、前記撮像素子がMOS型イメージ・センサーである場合には、正立読み出し手段または上下反転読み出し手段が、MOS型イメージ・センサーの垂直走査シフトレジスタの走査方向切り替え手段である。

【0011】

【作用】上記信号検出手段の信号にしたがって、映像表示手段に表示される映像が正立像となるように上記撮像素子の上記正立読み出し手段と上記倒立読み出し手段とを切り替えるので、ビデオカメラが映像表示手段によって一義的に定まる水平軸を中心に回転しても、映像表示手段に表示される映像はビデオカメラの向きに関係無く常に正立像となる。

【0012】CCDイメージ・センサーの垂直転送CCDおよびフォト・ダイオードの上部(または下部)に配置された水平転送CCDは垂直転送CCDから送られて来るフォト・ダイオードの電荷を一段づつ転送して正立像を得る。一方、垂直転送CCDおよびフォト・ダイオードの下部(または上部)に配置された水平転送CCDは垂直転送CCDから送られて来るフォト・ダイオードの電荷を一段づつ転送して倒立像を得る。信号検出手段の信号にしたがって上部または下部に配置された水平転送CCDのどちらかを動作させることによってビデオカメラの向く方向に関係無く常に正立像を得ることができる。

【0013】MOS型イメージ・センサーの場合は、フォト・ダイオードの1つ1つにFET(電界効果トラン

ジスタ)が組み合わせてあり、縦横に複数個並べられたフォト・ダイオードとFETとで構成される受光部の周りには水平シフト・レジスタおよび垂直シフト・レジスタが配置され、これらのシフト・レジスタに送りこむ走査用パルスを制御することによって任意のフォト・ダイオードの電荷を取りだすことができる。また、走査用パルスをシフト・レジスタに入力する方向によって反転した画像を得ることができる。すなわち、水平走査シフト・レジスタに通常と反対方向から走査用パルスを送りこめば鏡像画像が得られ、垂直走査シフト・レジスタに通常と反対方向から走査用パルスを送りこめば倒立画像が得られる。

【0014】

【実施例】本発明の一実施例を図1および図2に示す。図1は携帯用撮像装置1の前面2aが見える外観斜視図を示し、図2は背面2bが見える外観斜視図を示す。

【0015】携帯用撮像装置1はボディケース3の上縁部4の中央にカメラヘッド部5を回転可能に軸支し、ボディケース3の左隅部にアンテナ6を配置し、ボディケース3の前面2aには液晶ディスプレイ7、スピーカ8および操作ボタン9が配置され、ボディケース3の左側面10はマイク11およびバッテリー12が設けられ、ボディケース3の右側面13にはマイク14が配置されている。カメラヘッド部5はヘッドケース15の表面に滑り止め用のローレット16が彫り込まれ、撮影孔17が開けられている。操作ボタン9は電話番号を入力するための0から9までのダイヤルボタン18と、短縮ダイヤル機能やリダイヤル機能等の上側機能ボタン19および発信や終了等の下側機能ボタン20からなる。

【0016】図1はカメラヘッド部5をボディケース3前面2aに向けた状態を示し、操作者あるいは前面2a側に在る被写体を液晶ディスプレイ7の画面上に表示する。ボディケース3の上縁部4に、カメラヘッド部5を上縁部4に平行に、または液晶ディスプレイ7によって一義的に定まる水平方向と平行の軸を回転軸とする回転方向21に回転可能に軸支したので、左手でボディケース3を支えて液晶ディスプレイ7を見易い角度に保持し、右手の親指と人差指でカメラヘッド部5をつまんで回転し、カメラヘッド部5の撮影角度を設定することができる。

【0017】図2はカメラヘッド部5を回転して背面2bに向けた状態を示し、撮影者の前方に存在する被写体を撮影する場合の使用状態である。液晶ディスプレイ7は電子ビューファインダーとして作用し、表示された映像をボディケース3内部のメモリー(図示せず)や記録装置(図示せず)に記録したり直接送信したりする。

【0018】図3および図4に携帯用撮像装置1の内部構造を示す。

【0019】図3は図1のA-A断面図であり、図4は図1の内部構成斜視図である。図3および図4を参照し

ながら説明する。ヘッドケース15の内部にはビデオカメラ22が正立状態で配置されている。カメラヘッド部5の下方には液晶ディスプレイ7、スピーカ8、操作ボタン9、電源回路および音声基板23、RF(Radio Frequency)基板24、ビデオカメラ信号処理および液晶ディスプレイ基板25、メモリおよびコントロール基板26、等から構成される。図4に示したフレーム27は、ヘッドケース15を可回転に軸支持するもので、一方に小孔28が穿けられ、他方には大孔29を有するリング30が嵌められている。図4に示したビデオカメラ22はヘッドケース15を取り去った状態で図示。ビデオカメラ22は、シャッター31とレンズ32、撮像素子33および撮像素子回路基板34から構成され、シャッター31が開くとレンズ32によって被写体の像が撮像素子33に結像する。撮像素子回路基板34とビデオカメラ信号処理および液晶ディスプレイ基板25とはフレキシブルケーブル35で結線されている。フレキシブルケーブル35は大孔29近辺はコイル状に巻かれており、ビデオカメラ22が回転してもフレキシブルケーブル35に折れ目が発生して捩じり切れないように配慮している。

【0020】図5にカメラヘッド部5の外観図を示す。ヘッドケース15の右側面にはダンパー36が2本のねじ37、38で固定されている。ダンパー36の軸39はヘッドケース15の回転中心と一致しており、軸39の側面には平行な2平面を有する。ダンパー36のねじ38近傍の突起40はフレーム27に設けたストッパー67(図6参照)に当接してカメラヘッド部5の過回転を防止するものである。本実施例のカメラヘッド部5は略240度回転可能に設計されている。ダンパー36の上下に設けた2本の突起41、42は映像切り替えスイッチ60(図6参照)にうがった小孔65、66とそれぞれ嵌合して、映像切り替えスイッチ60を回転させる役目をする。

【0021】図6はカメラヘッド部5の分解構成図を示す。ヘッドケース15はケース前部43とケース後部44とから構成され、2つのケースはケース前部43に一体成形された4本の柱45、46、47、48にタッピングねじ49、50、51、52をねじり込むことによって結合される。ビデオカメラ22は一体に構成されている撮像素子回路基板34を4本の柱45、46、47、48に4本のねじ53、54、55、56を用いて固定する。4本の柱45、46、47、48にはそれぞれねじ穴が2個ずつあり、ケース後部44と撮像素子回路基板34とを固定することができる。ケース前部43とケース後部44の左側面には半円の筒部57、58があり、ケース前部43とケース後部44が一体に合わさって円筒となり、フレーム27の大孔29に嵌まり込む。フレーム27の小孔28には映像切り替えスイッチ60の突起61(図7参照)が嵌合して映像切り替えス

イッチ60が位置決めされ、映像切り替えスイッチ60は2本のねじ62、63で固定される。映像切り替えスイッチ60の中心には小孔64が穿けられ、ダンパー36の軸39が嵌合する。また前述のごとく映像切り替えスイッチ60の上下に穿けられた小孔65、66にはダンパー36の上下に設けた2本の突起41、42が嵌合する。フレーム27の内側にはストッパー67が2本のねじ68、69で固定される。前述のごとく、ストッパー67にはダンパー36の突起40が当接してカメラヘッド部5の過回転を防止している。ダンパー36は背面の突起85をヘッドケース15の側面に開けた穴86に嵌入させて、ヘッドケース15の回転中心とダンパー36の回転中心とを一致させる。

【0022】図7はダンパー36と映像切り替えスイッチ60とを結合した断面図を示す。ダンパー36は、ダンパーケース70、回転部71、Oリング72およびダンピングオイル73から構成される。ダンパーケース70は突起41、42を有する。回転部71は円盤部74と軸39とからなる。円盤部74とダンパーケース70の間にはダンピングオイル73が注入されており、Oリング72はダンピングオイル73の漏れ止めをしている。円盤部74の周辺はダンピングケース70に嵌合しており、回転可能に支持されている。映像切り替えスイッチ60は切り替えスイッチケース75とスイッチ回転部76とからなる。切り替えスイッチケース75は背面に突起61を有し、前面には突起61と同軸に小孔64が穿けられており、空間部77には円弧状の導体78、79(図8参照)が固着されている。スイッチ回転部76には周辺部に小孔65、66が穿けられ、裏面には導電性材料から成る摺動部材80が固着されている。小孔64は平行な2平面を有しており、平行な2平面を有するダンパー36の軸39が嵌合する。したがって、切り替えスイッチケース74がフレーム27に固定されているので回転部71は回転せず、相対的にダンパーケース70が回転する。またダンパーケース70の2本の突起41、42はスイッチ回転部76の2個の小孔65、66に嵌合し、ダンパー36が回転するとスイッチ回転部76は回転し、摺動部材80が導体78、79の上を摺動してスイッチ切り替えを行う。

【0023】図8は映像切り替えスイッチ60の導体78、79のパターン図を示す。矢印81はレンズ32の光軸方向を示す。摺動部材80は矢印81と連動して回転し、導体78、79を断続する。導体78は内側の円環状のパターンを示し、端子82を有する。導体79は外側の円弧状のパターンを示し、矢印81方向の狭い部分(円弧のなす角度75度)79aと、その他の広い部分(円弧のなす角度165度)79bの2つの部分からなる。狭い部分(円弧のなす角度75度)79bは端子83を有し、広い部分(円弧のなす角度165度)79aは端子84を有する。図中、矢印81の向いている方

向は図1または図3に示した状態を示し、ビデオカメラ5の撮影孔17が液晶ディスプレイ7側すなわち筐体前面2a側に向いている状態を示す。この時ビデオカメラ22は正立状態である。

【0024】図9は図8の、図10は図3の各々の動作説明図である。すなわち図2で説明したように、カメラヘッド部5を回転して撮影孔17（矢印81）を背面2bに向けた状態を示し、撮影者の前方に存在する被写体を撮影する場合である。ビデオカメラ22は水平軸周りに180度回転したので倒立状態にある。しかしながら摺動部材80が導体78と導体79aの導通状態から導体78と導体79bの導通状態に切り替えるので、ビデオカメラ22が倒立状態でもビデオカメラ22から出力される映像信号は正立映像となる。倒立映像を正立映像に変換する方法については後述する。

【0025】図11は図8の、図12は図3のそれぞれの動作説明図である。図11は矢印81が真下すなわち筐体2内部に向いた状態を示す。図12で示すように、カメラヘッド部5の撮影孔17は真下すなわちボディケース3内部に回り込んでボディケース3にカバーされている状態を示す。これは使用していない状態または格納状態を示す。撮影孔17がボディケース3によってカバーされるのでレンズ32（図4参照）が埃で汚れることが無い。摺動部材80は導体78にのみ接触しており導体79には接触していない。すなわち撮像装置のシステム全体のスイッチが切られた状態を示す。

【0026】図13は撮像素子33の従来例を示し、最も実用化例の多いインタライン転送型CCD撮像素子の基本構成図である。101は受光素子であるフォトダイオード、102は垂直転送CCD（Charge Coupled Device）、103は転送ゲート、104は水平転送CCD、105は読み出しゲート、106は出力アンプ、107は転送ゲートパルス、108は読み出しクロックパルス、109は信号出力である。

【0027】フォトダイオード101は縦に一列に並べられており、フォトダイオード101の列とフォトダイオード101の列との間にそれぞれのフォトダイオード101に専用の垂直転送CCD102が配置されており、フォトダイオード101と垂直転送CCD102とは電極でつながっている。フォトダイオード101に光が当たるとフォトダイオード101に電荷が発生する。垂直帰線期間に転送ゲート103より転送ゲートパルス107を入力すると全部のフォトダイオード101の電荷がそれぞれ隣に引越し、垂直転送CCD102に移動する。垂直転送CCD102の信号は水平走査毎に1段づつ下に転送される。下端の水平転送CCD104迄来た信号は、読み出しゲート105に入力された読み出しクロックパルス108によって次々と右の方に転送されて行き、出力アンプ106で増幅されて信号出力109となる。

【0028】図14は撮像素子33の本発明の第1の実施例であるインタライン転送型CCD撮像素子の基本構成図を示す。110は受光素子であるフォトダイオード、111は垂直転送CCD、112は転送ゲート、113は第1の水平転送CCD、114は第1の読み出しゲート、115は第1の出力アンプ、116は転送ゲートパルス、117は第1の読み出しクロックパルス、118は第1の信号出力、119は第2の水平転送CCD、120は第2の読み出しゲート、121は第2の読み出しクロックパルス、122は第2の出力アンプ、123は第2の信号出力、124は第1の信号出力切り替えスイッチである。

【0029】フォトダイオード110に光が当たるとフォトダイオード110に電荷が発生する。垂直帰線期間に転送ゲート112より転送ゲートパルス116を入力すると全部のフォトダイオード110の電荷がそれぞれ隣に引越し、垂直転送CCD111に移動する。垂直転送CCD111の信号は水平走査毎に1段づつ上に転送するかあるいは下方に転送するかは、転送ゲートパルス116を下方から入力するかあるいは上方から入力するか、その方向によって決定される。転送ゲートパルス116は転送ゲート112に接続された駆動パルス発生回路（図示せず）およびその入力方向を決定するマイクロコンピュータ（図示せず）によって発生させられる。マイクロコンピュータが入力方向を下方に設定すると、垂直転送CCD111の信号は水平走査毎に1段づつ下に転送される。下端の第1の水平転送CCD113迄来た信号は、第1の読み出しゲート114に入力された第1の読み出しクロックパルス117によって次々と右の方に転送されて行き、第1の出力アンプ115で増幅されて第1の信号出力118となる。一方、マイクロコンピュータが入力方向を上方に設定すると、垂直転送CCD111の信号は水平走査毎に1段づつ上に転送される。上端の第2の水平転送CCD119迄来た信号は、第2の読み出しゲート120に入力された第2の読み出しクロックパルス121によって次々と右方に転送されて行き、第2の出力アンプ122で増幅されて信号出力123となる。第1の信号出力118と第2の信号出力123とは第1の信号出力切り替えスイッチ124で切り替えられる。第1の信号切り替えスイッチ124での切り替えは、図8で示した映像切り替えスイッチ60に連動して行われる。すなわちビデオカメラ22が筐体前面2a方向を向いて正立しており、摺動部材80が導体78と79bに接触して導体78と79bが導通状態にある場合は、第1の信号出力切り替えスイッチ124は図14に示すように信号出力118側に接続されており、正立映像となる第1の出力アンプ115の信号を出力する。反対にビデオカメラ22が筐体背面2b方向を向いて倒立しており、摺動部材80が導体78と79aに接触して導体78と79aが導通状態にある場合

は、第1の信号出力切り替えスイッチ124は信号出力123側に接続されて、倒立映像となる第2の出力アンプ122の信号を出力する。したがって倒立しているビデオカメラ22から倒立映像が出力されると、その映像は正立映像となって液晶ディスプレイ7に表示される。

【0030】図15は撮像素子33の本発明の第2の実施例であるインタライン転送型CCD撮像素子の基本構成図を示す。110は受光素子であるフォトダイオード、111は垂直転送CCD、112は転送ゲート、113は第1の水平転送CCD、114は第1の読み出しゲート、115は第1の出力アンプ、116は転送ゲートパルス、117は第1の読み出しクロックパルス、118は第1の信号出力、119は第2の水平転送CCD、120は第2の読み出しゲート、121は第2の読み出しクロックパルス、122は第2の出力アンプ、123は第2の信号出力、124は第1の信号出力切り替えスイッチ、125は第3の出力アンプ、126は第3の信号出力、127は第4の出力アンプ、128は第4の信号出力、129は第2の信号切り替えスイッチ、130は第3の信号切り替えスイッチである。

【0031】フォトダイオード110に光が当たるとフォトダイオード110に電荷が発生する。垂直帰線期間に転送ゲート112より転送ゲートパルス116を入力すると全部のフォトダイオード110の電荷がそれぞれ隣に引越して垂直転送CCD111に移動する。垂直転送CCD111の信号を水平走査毎に1段づつ上方に転送するか、あるいは下方に転送するかは、転送ゲートパルス116を下方から入力するか、あるいは上方から入力するか、その方向によって決定される。転送ゲートパルス116は転送ゲート112に接続された駆動パルス発生回路（図示せず）およびその入力方向を決定するマイクロコンピュータ（図示せず）によって発生させられる。下端の第1の水平転送CCD113または上端の第2の水平転送CCD119迄来た信号は、第1の読み出しゲート114に入力された第1の読み出しクロックパルス117あるいは第2の読み出しゲート120に入力された第2の読み出しクロックパルス121によって次々と水平方向に転送されて行き、第1ないし第4の出力アンプ115、122、125、127で増幅されてそれぞれ信号出力118、123、126、128となる。信号出力118と信号出力123は第1の信号出力切り替えスイッチ124切り替えられる。信号出力126と信号出力128は第2の信号出力切り替えスイッチ129で切り替えられる。第1の信号出力切り替えスイッチ124あるいは第2の信号出力切り替えスイッチ129での切り替えは映像切り替えスイッチ60に連動して行われる。すなわちビデオカメラ22が筐体前面2a方向を向いて正立しており、摺動部材80が導体78と79bに接触して導体78と79bが導通状態にある場合は、第1の信号出力切り替えスイッチ124あるいは

第2の信号出力切り替えスイッチ129は図15に示すように信号出力118あるいは信号出力126側に接続されており、正立映像となる第1の出力アンプ115あるいは第3の出力アンプ125の信号を出力する。反対にビデオカメラ22が筐体背面2b方向を向いて倒立しており、摺動部材80が導体78と79aに接触して導体78と79aが導通状態にある場合は、第1の信号出力切り替えスイッチ124あるいは第2の信号出力切り替えスイッチ129は信号出力123あるいは信号出力128側に接続されて、倒立映像となる第2の出力アンプ122あるいは第4の出力アンプ127の信号を出力する。したがって、倒立しているビデオカメラ22から倒立映像が出力されると、その映像は正立映像となって液晶ディスプレイ7に表示される。

【0032】一方、下端の第1の水平転送CCD113または上端の第2の水平転送CCD119迄来た信号が第1の出力アンプ115（または第2の出力アンプ122）方向に、あるいは第3の出力アンプ125（または第4の出力アンプ127）方向に行くかは第1の読み出しクロックパルス117あるいは第2の読み出しクロックパルス121を左方から入力するかあるいは右方から入力するかその方向によって決定される。第1の読み出しクロックパルス117あるいは第2の読み出しクロックパルス121は第1の読み出しゲート114および第2の読み出しゲート120に接続された駆動パルス発生回路（図示せず）およびその入力方向を決定するマイクロコンピュータ（図示せず）によって発生させられる。第1の信号出力118あるいは第2の信号出力123は左右が正しい実像である。すなわち第1の信号出力118は正立実像であり、第2の信号出力123は倒立実像である。一方、第3の信号出力126あるいは第4の信号出力128は左右が反転した鏡像である。すなわち第3の信号出力126は正立鏡像であり、第4の信号出力128は倒立鏡像である。最終的な信号出力を実像または鏡像にするかは第3の信号切り替えスイッチ130によって切り替える。第3の信号切り替えスイッチ130は操作ボタン9に設けた機能ボタン19、20を操作することによって行うことができる。

【0033】図16は本発明の第3の実施例を示し、倒立像を正立像に変換できる撮像素子33としてMOS型撮像素子をあらわす。MOS型撮像素子は光電面200を構成する複数の受光ユニット201にはフォトダイオードと垂直スイッチング・トランジスタ（MOS-FET: Metal Oxide Silicon）が組み込まれており、受光ユニット201毎の信号取り出しが可能である。受光ユニット201の上部は水平スイッチング・トランジスタ（MOS-FET）202を介して水平シフト・レジスタ203に接続されており、受光ユニット201の側面には垂直シフト・レジスタ204が接続されている。水平スイッチング・トランジスタは出



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力アンプ205につながり、水平シフト・レジスタ203と垂直シフト・レジスタ204とで選択された受光ユニット201の出力を増幅して信号出力端子206に信号を出力する。水平シフト・レジスタ203にはクロック・パルスを入力する順方向端子207と逆方向端子208があり、切り替えスイッチ209でクロック・パルスの入力方向を切り替えることによって水平シフト・レジスタ203の走査方向を変え、実像と鏡像の変換を行う。また垂直シフト・レジスタ204にはクロック・パルスを入力する順方向端子210と逆方向端子211

があり、切り替えスイッチ212でクロック・パルスの入力方向を切り替えることによって垂直シフト・レジスタ204の走査方向を変え、正立像と倒立像の変換を行う。  
【0034】切り替えスイッチ209の操作は図1に示した操作ボタン9に設けた機能ボタン19、20を操作することによって行う。図16に示したように切り替えスイッチ209が順方向端子207に接続されてい

れば、実像が液晶ディスプレイ7に表示され、逆方向端子208に接続されると鏡像が液晶ディスプレイ7に表示される。  
【0035】切り替えスイッチ212の操作は映像切り替えスイッチ60に連動して行われる。すなわちビデオカメラ22が筐体前面2a方向を向いて正立しており、摺動部材80が導体78と79bに接触して導体78と79bが導通状態にある場合は、切り替えスイッチ212は図16に示すように順方向端子210に接続されており、正立映像を出力アンプ205より出力する。反対にビデオカメラ22が筐体背面2b方向を向いて倒立しており、摺動部材80が導体78と79aに接触して導体78と79aが導通状態にある場合は、切り替えスイッチ209は逆方向端子208側に接続されて、倒立映像を出力アンプ205より出力する。したがって、倒立しているビデオカメラ22から倒立映像が出力されると、その映像は正立映像となって液晶ディスプレイ7に表示される。

【0036】

【発明の効果】本発明の効果は、ビデオカメラの撮像素子自体に倒立像読みだし手段を設けたので、筐体を回転させなくとも容易に正立像を得ることができる。すなわ

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ち、ビデオカメラの角度位置に従って正立像読み出し手段と倒立像読み出し手段とを切り替えるので、自動的に正立像とすることができ、誤って倒立像を記録したり送信したりすることが防止できる。

【図面の簡単な説明】

【図1】本発明の第1の実施例の撮像装置の前面から見た外観斜視図である。

【図2】本発明の第1の実施例の撮像装置の背面から見た外観斜視図である。

【図3】図1のA-A断面図である。

【図4】本発明の第1の実施例の撮像装置の内部構成図である。

【図5】本発明の第1の実施例の撮像装置の部品斜視図である。

【図6】図5の分解構成図である。

【図7】本発明の第1の実施例の回転機構部の中心断面図である。

【図8】本発明の第1の実施例の切り替えスイッチパターン図である。

【図9】図8の動作説明図である。

【図10】図3の動作説明図である。

【図11】図8の動作説明図である。

【図12】図3の動作説明図である。

【図13】従来の撮像素子の基本構成図である。

【図14】本発明の第1の実施例の撮像素子の基本構成図である。

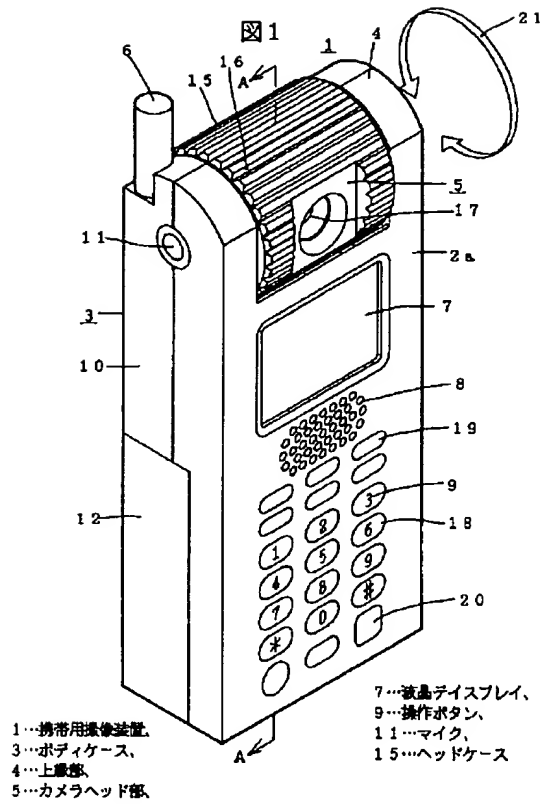
【図15】本発明の第2の実施例の撮像素子の基本構成図である。

【図16】本発明の第3の実施例の撮像素子の基本構成図である。

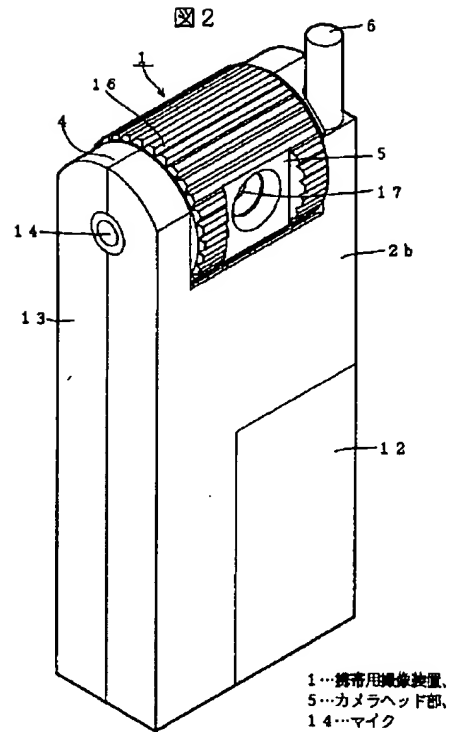
【符号の説明】

1…携帯用撮像装置、4…上縁部、5…カメラヘッド部、7…液晶ディスプレイ、22…ビデオカメラ、33…撮像素子、36…ダンパー、60…映像切り替えスイッチ、101、110…フォトダイオード、102、111…垂直転送CCD、104、114、119…水平転送CCD、106、115、122、125、127…出力アンプ、124、128、130…信号切り替えスイッチ。

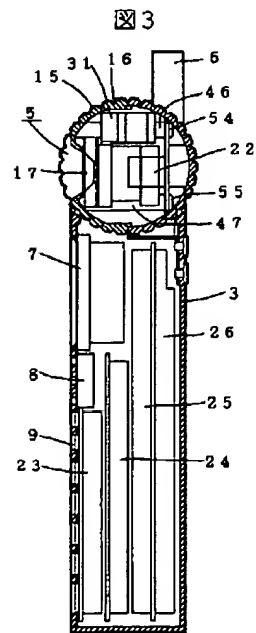
【図1】



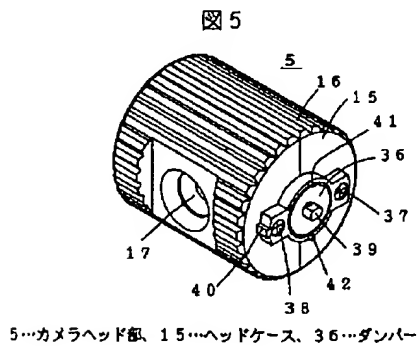
【図2】



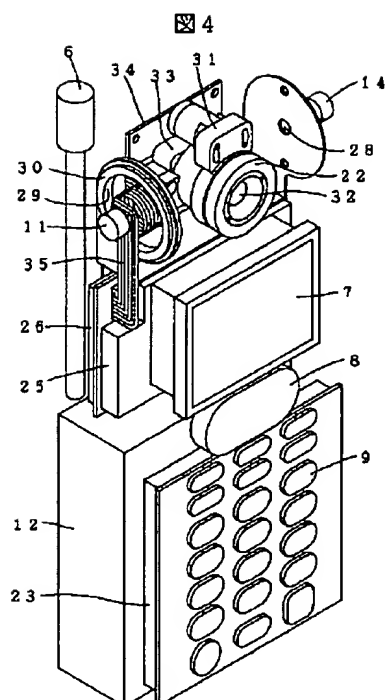
【図3】



【図5】

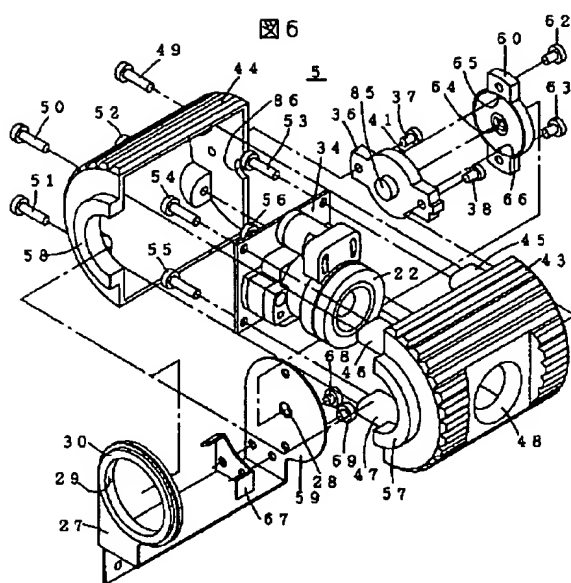


【図4】



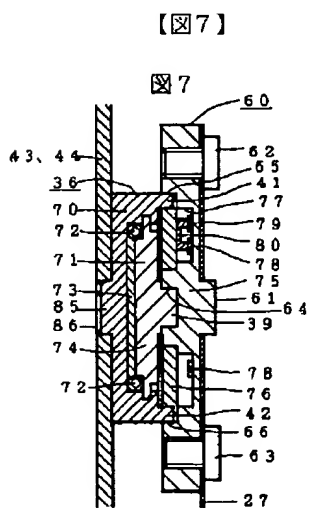
7…液晶ディスプレイ、8…スピーカ、9…操作ボタン、  
22…ビデオカメラ、23、24、25、26…基板、  
27…フレーム、35…フレキシブルケーブル

【図6】



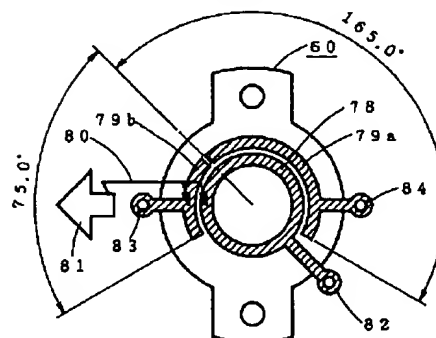
5…カメラヘッド部、22…ビデオカメラ、27…フレーム、  
30…リング、36、ダンパー、43、44…ヘッドケース、  
60…映像切り替えスイッチ、67…ストッパ

【図8】



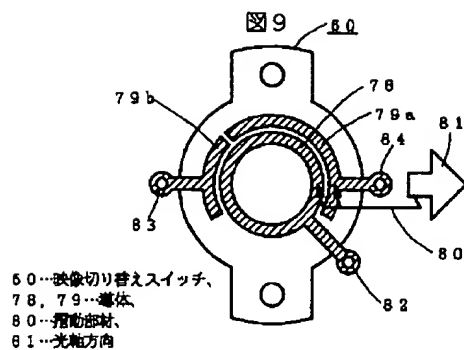
27…フレーム、36、ダンパー、43、44…ヘッドケース、  
60…映像切り替えスイッチ、70…ダンパーケース、  
71…回転部、75…切り替えスイッチケース、76…スイッチ回転部

図8

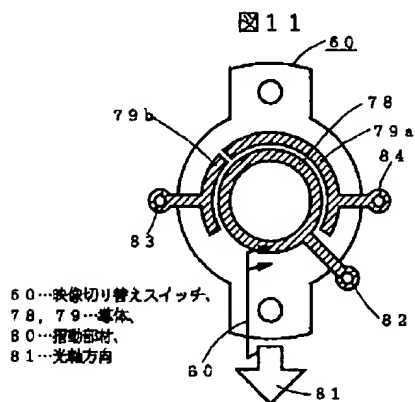


60…映像切り替えスイッチ、78、79…導体、  
80…滑動部材、81…光軸方向

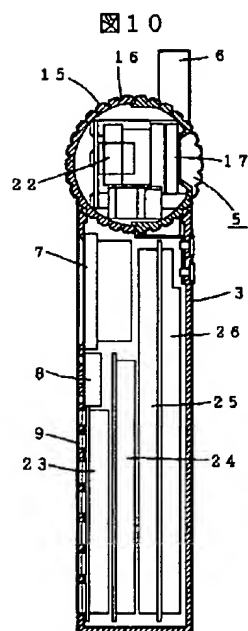
【図9】



【図11】

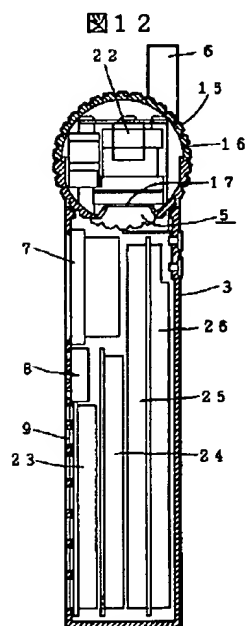


【図10】



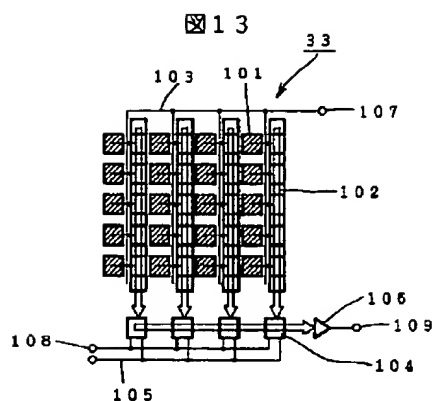
5…カメラヘッド部、7…液晶ディスプレイ、8…スピーカ、  
9…操作ボタン、15…ヘッドケース、22…ビデオカメラ、  
23、24、25、26…基板

【図12】



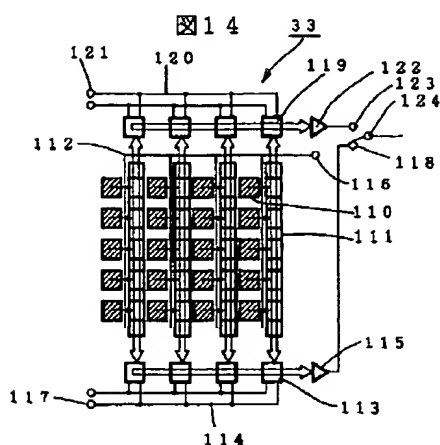
5…カメラヘッド部、7…液晶ディスプレイ、8…スピーカ、  
9…操作ボタン、15…ヘッドケース、22…ビデオカメラ、  
23、24、25、26…基板

【図13】



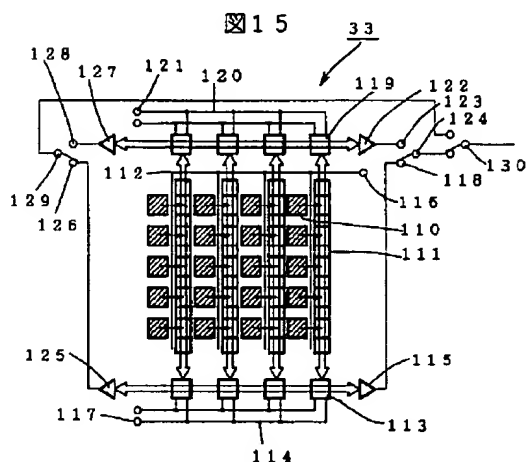
33…撮像素子、101…フォトダイオード、102…垂直転送CCD、  
103…転送ゲート、104…水平転送CCD、106…出力アンプ

【図14】



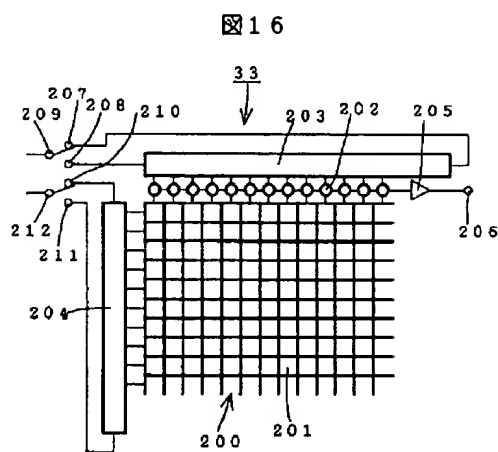
33…撮像素子、110…フォトダイオード、115…第1の出力アンプ  
122…第2の出力アンプ、124…第1の信号切り替えスイッチ

【図15】



33…撮像素子、110…フォトダイオード、115…第1の出力アンプ  
122…第2の出力アンプ、124…第1の信号切り替えスイッチ、  
125…第3の出力アンプ、127…第4の出力アンプ、  
129…第2の信号切り替えスイッチ、130…第3の信号切り替えスイッチ

【図16】



33…撮像素子、201…受光ユニット、202…水平スイッチング・  
トランジスタ、203…水平シフト・レジスタ、204…垂直シフト・  
レジスタ

JAPANESE

[JP,08-223492,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION  
TECHNICAL PROBLEM MEANS OPERATION EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

**\* NOTICES \***

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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**CLAIMS**

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[Claim(s)]

[Claim 1] In portable image pick-up equipment equipped with the case which contained the graphic display means, and the video camera supported to revolve pivotable centering on the horizontal shaft of this case that becomes settled uniquely with this graphic display means In the above-mentioned case, it has a location detection means corresponding to the angle-of-rotation location to this case of the above-mentioned video camera. It is portable image pick-up equipment characterized by for the above-mentioned video camera having an image sensor, and for this image sensor having an inverted-image read-out means with an erect-image read-out means, and changing the above-mentioned erect-image read-out means of the above-mentioned image sensor, and the above-mentioned inverted-image read-out means according to the signal of the above-mentioned signal detection means.

[Claim 2] Portable image pick-up equipment according to claim 1 characterized by for the above-mentioned image sensor being CCD series, and the above-mentioned erect-image read-out means or the above-mentioned inverted-image read-out means being the level transfer CCD prepared in the upper part or the lower part of the perpendicular transfer CCD and a photodiode.

[Claim 3] Portable image pick-up equipment according to claim 1 with which the above-mentioned image sensors are MOS mold image sensors, and the above-mentioned erect-image read-out means or the above-mentioned inverted-image read-out means is a scanning direction change means of the vertical-scanning shift register of these MOS mold image sensors, and is characterized by changing the above-mentioned vertical-scanning shift register's scanning direction according to the signal of the above-mentioned signal detection means.

[Claim 4] The image sensor characterized by being the CCD series which consisted of level transfers CCD of the lot prepared in the upper part and the lower part of a photodiode, the perpendicular transfer CCD and this photodiode, and this perpendicular transfer CCD.

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[Translation done.]

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3. In the drawings, any words are not translated.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

**[Industrial Application]** This invention relates to the portable image pick-up equipment which adjusts the include angle of a video camera and photos a photographic subject, while the portable image pick-up equipment with which the video camera was equipped as image photography equipment, and it was equipped with the flat-surface display of a direct viewing type as a graphic display device is started, especially a photography person acts as a monitor on a flat-surface display. There is an electronic "still" camera which has a VTR one apparatus video camera, solid-state memory, and a video floppy as this kind of portable image pick-up equipment.

**[0002]** Moreover, a camera one apparatus personal digital assistant (PDA:Personal Data Assistant), a camera one apparatus cellular phone, etc. are proposed newly.

**[0003]**

**[Description of the Prior Art]** As this kind of portable image pick-up equipment, "the camcorder/movie with monitor TV" of an indication is in JP,4-6154,B conventionally. the image pick-up equipment of the indication to JP,4-6154,B -- the VTR section and the monitor TV section -- a case -- dedicating -- as one -- constituting -- the video camera section -- the right lateral of a case -- it supports to revolve pivotable centering on a horizontal shaft into a central part mostly. This camcorder/movie is held so that the whole equipment may be supported with the right hand or the monitor section may carry out a right pair (a photography person's look is to the flat surface of the monitor section) to a photography person with a case with the left hand, it has the video camera section with the right hand, by twisting this video camera section to the monitor section, a video camera inclines, and is changed and photos a photographic subject.

**[0004]** Moreover, VTR and a liquid crystal display are made Etsuo etc. Hoshikawa etc. on left-hand side at one "high-definition MS movie VL-HL1" (the Sharp technical report No. 54 and November, 1992 pp 67-70), and the image pick-up equipment which supported both of each other to revolve pivotable is carried.

**[0005]** The video camera section is rotated 180 degrees, these types of image pick-up equipment can be turned in the same direction as the monitor section, and the photography person was able to photo himself. Generally, when photoing the photographic subject which is ahead of a photography person, the video camera is set so that top and bottom may be photoed normally. Therefore, as for a display image or a record image, a handstand image will be displayed or recorded, when a video camera is rotated 180 degrees centering on a horizontal axis and a video camera is made a handstand. then, these types of image pick-up equipment -- using -- top and bottom -- the approach of turning a video camera to the photography person itself first (a video camera standing erect), carrying out rotation (a monitor doing a handstand) of the monitor 180 degrees, and subsequently to centering on a horizontal axis turning him to the photography person itself in order to acquire a normal record image (erection image) -- adoption \*\*\*\*\*. Since a monitor's display would be an inverted image at this time, a monitor's perpendicular direction scan was reversed and the erection image had been acquired.

**[0006]**

**[Problem(s) to be Solved by the Invention]** Since the above-mentioned conventional example is the method which is made to reverse a monitor's perpendicular direction scan and obtains an erect image, when a video camera turns to a value monitor screen side, an erection image is displayed on a monitor regardless of erection or handstand of a video camera always. That is, since a monitor's direction of a vertical scanning is reversed even if it holds a video camera in the erection condition and makes a monitor side do a handstand, even if an erection image is displayed on a monitor, it holds a video camera in the handstand condition on the contrary and it erects a monitor side, vertical reversal of the handstand image input of a video camera is carried out by the



monitor, and an erection image is displayed. that is, -- whether it does a handstand in a video camera side or does a handstand in a monitor side on the contrary -- a monitor -- always -- top and bottom -- a normal image will be displayed. Therefore, a photography person cannot judge whether a handstand should be done in the thing which should just do a handstand in a video camera, or a monitor only by seeing the image displayed on the monitor. It is the right that erect a video camera in order to always record an erection image, since the photography image of a video camera is recorded on record devices, such as VTR, as it is, and a monitor does a handstand. However, it is the operation which is held so that the right pair of the monitoring screen may usually be carried out to a photography person at the time of photography, changes the include angle of a video camera, and follows a photographic subject. Therefore, also when photoing the photography person itself, the extension is considered, a monitor is held as it is, and the case where rotate 180 degrees, make the video camera itself do a handstand, and a photograph is taken occurs. In this case, there was a problem that a handstand image will be recorded in a record device.

[0007] Moreover, like this invention, neither with a camera one apparatus personal digital assistant (PDA) nor a camera one apparatus cellular phone, since a telephone number manual operation button is arranged at a graphic display side case and an alphabetic character is displayed on a monitor, a monitor can be used, doing a handstand. Then, when a video camera does a handstand, it will be necessary to erection-ize a handstand image.

[0008]

[Means for Solving the Problem] In order to solve the technical problem of the above-mentioned conventional example or a new proposal product, a location detection means to detect that the video camera turned to the monitor side was established in the case, and the video camera consisted of image sensors which have a handstand read-out means with an erection read-out means.

[0009] When an image sensor is CCD series, specifically, it is the level transfer CCD of the lot by which the erection read-out means or the handstand read-out means was formed in the upper part or the lower part of the perpendicular transfer CCD and a photodiode.

[0010] Moreover, when said image sensors are MOS mold image sensors, an erection read-out means or a vertical reversal read-out means is a scanning direction change means of the vertical-scanning shift register of MOS mold image sensors.

[0011]

[Function] Since the above-mentioned erection read-out means of the above-mentioned image sensor and the above-mentioned handstand read-out means are changed so that the image displayed on a graphic display means may turn into an erect image according to the signal of the above-mentioned signal detection means, even if a video camera rotates centering on the horizontal axis which becomes settled uniquely with a graphic display means, the image displayed on a graphic display means always turns into an erect image with regards to the sense of a video camera that there is nothing.

[0012] The level transfer CCD arranged in the perpendicular transfer CCD of CCD series and the upper part (or lower part) of a photodiode transmits at a time one step of charge of the photodiode sent from the perpendicular transfer CCD, and obtains an erect image. On the other hand, the level transfer CCD arranged at the lower part (or upper part) of the perpendicular transfer CCD and a photodiode transmits at a time one step of charge of the photodiode sent from the perpendicular transfer CCD, and obtains an inverted image. With regards to the direction which a video camera turns to, an erect image can always be obtained that there is nothing by operating one of the level transfers CCD arranged at the upper part or the lower part according to the signal of a signal detection means.

[0013] In the case of MOS mold image sensors, FET (field-effect transistor) is combined with each of photodiodes, a level shift register and a perpendicular shift register are arranged around the light sensing portion which consists of a photodiode put in order in all directions and FET, and the charge of the photodiode of arbitration can be taken out by controlling the pulse for a scan sent into these shift registers. [ two or more ] Moreover, the image which reversed the pulse for a scan according to the direction inputted into a shift register can be obtained. That is, if the pulse for a scan is sent into a horizontal scanning shift register from usual and an opposite direction, a mirror image image will be obtained, and a handstand image will be obtained if the pulse for a scan is sent into a vertical-scanning shift register from usual and an opposite direction.

[0014]

[Example] One example of this invention is shown in drawing 1 and drawing 2. Drawing 1 shows the appearance perspective view whose front 2a of portable image pick-up equipment 1 can be seen, and drawing 2

shows the appearance perspective view whose tooth-back 2b can be seen.

[0015] Portable image pick-up equipment 1 supports the camera head section 5 to revolve pivotable in the center of the rising wood 4 of the body case 3, an antenna 6 is arranged in the left corner section of the body case 3, a liquid crystal display 7, a loudspeaker 8, and a manual operation button 9 are arranged at front 2a of the body case 3, a microphone 11 and a dc-battery 12 are formed, and, as for the left lateral 10 of the body case 3, the microphone 14 is arranged at the right lateral 13 of the body case 3. The front face of the head case 15 was engraved with the knurling tool 16 for skids, and the photography hole 17 has opened the camera head section 5. A manual operation button 9 consists of dial carbon buttons 18 from 0 to 9 for inputting the telephone number, and bottom feature buttons 20, such as the top feature buttons 19, such as an abbreviated dialing function and a redial function, and dispatch, and termination.

[0016] Drawing 1 shows the condition of having turned the camera head section 5 to front-face of body case 3 2a, and displays the photographic subject in the operator or front 2a side on the screen of a liquid crystal display 7. Since it supported to revolve pivotable to the hand of cut 21 which sets a revolving shaft as a shaft parallel to horizontally it becomes settled uniquely with a liquid crystal display 7 in parallel with rising wood 4 about the camera head section 5 in the rising wood 4 of the body case 3, the body case 3 can be supported with the left hand, and a liquid crystal display 7 can be held at a legible include angle, and by the right thumb and a right forefinger, the camera head section 5 can be pinched, it can rotate, and whenever [ angle-of-coverage / of the camera head section 5 ] can be set up.

[0017] Drawing 2 is a busy condition in the case of photoing the photographic subject which shows the condition of having rotated the camera head section 5 and having turned to tooth-back 2b, and exists ahead of a photography person. A liquid crystal display 7 acts as an electronic view finder, and records the displayed image on the memory (not shown) and the recording device (not shown) of the body case 3 interior, or transmits it directly.

[0018] The internal structure of portable image pick-up equipment 1 is shown in drawing 3 and drawing 4.

[0019] Drawing 3 is the A-A sectional view of drawing 1, and drawing 4 is the internal configuration perspective view of drawing 1. It explains referring to drawing 3 and drawing 4. Inside the head case 15, the video camera 22 is arranged in the state of erection. Under the camera head section 5, it consists of a liquid crystal display 7, a loudspeaker 8, a manual operation button 9, a power circuit and the voice substrate 23, the RF (Radio Frequency) substrate 24, video camera signal processing and a liquid crystal display substrate 25, memory, a control substrate 26, etc. the frame 27 shown in drawing 4 should carry out axial support of the head case 15 at good rotation, and a stoma 28 should put it on to one side -- the ring 30 which has an osculum 29 is put on \*\*\*\* and another side. The video camera 22 shown in drawing 4 is in the condition which removed the head case 15, and is \*\*\*\*\*. A video camera 22 consists of a shutter 31, a lens 32, an image sensor 33, and the image sensor circuit board 34, and if a shutter 31 opens, the image of a photographic subject will carry out image formation of it to an image sensor 33 with a lens 32. Connection of the image sensor circuit board 34, video camera signal processing, and the liquid crystal display substrate 25 is carried out by the flexible cable 35. The flexible cable 35 is wound around the coiled form, and it considers the osculum 29 neighborhood so that a crease may occur on the flexible cable 35 and may not twist and go out on it, even if a video camera 22 rotates.

[0020] The external view of the camera head section 5 is shown in drawing 5. The damper 36 is being fixed to the right lateral of the head case 15 with two screw threads 37 and 38. The shaft 39 of a damper 36 is in agreement with the center of rotation of the head case 15, and has two flat surfaces parallel to the side face of a shaft 39. The about 38 screw thread [ of a damper 36 ] projection 40 prevents the overspeed r.p.m. of the camera head section 5 in contact with the stopper 67 (refer to drawing 6) which prepared in the frame 27. The camera head section 5 of this example is designed pivotable 240 abbreviation. The projections 41 and 42 of two which the absorber 36 prepared up and down fit in, respectively with the stomata 65 and 66 dug to the image changeover switch 60 (refer to drawing 6), and carry out the duty which rotates the image changeover switch 60.

[0021] Drawing 6 shows the decomposition block diagram of the camera head section 5. The head case 15 consists of case anterior part 43 and a case posterior part 44, and two cases are combined by twisting tapping screws 49, 50, 51, and 52 into four columns 45, 46, 47, and 48 really fabricated by the case anterior part 43. A video camera 22 uses four screw threads 53, 54, 55, and 56 for four columns 45, 46, 47, and 48, and fixes to them the image sensor circuit board 34 constituted by one. Two tapped holes can fix a \*\*\*\*, the case posterior part 44, and the image sensor circuit board 34 to four columns 45, 46, 47, and 48 at a time, respectively. There

are cylinder parts 57 and 58 of a semicircle in the left lateral of the case anterior part 43 and the case posterior part 44, and the case anterior part 43 and the case posterior part 44 are put together to one, serve as a cylinder, and fit into the osculum 29 of a frame 27. The projection 61 (refer to drawing 7) of the image changeover switch 60 fits into the stoma 28 of a frame 27, the image changeover switch 60 is positioned, and the image changeover switch 60 is fixed with two screw threads 62 and 63. a stoma 64 should put on in the core of the image changeover switch 60 -- the shaft 39 of \*\*\*\* and a damper 36 fits in. moreover, the image changeover switch 60 should put on up and down like the above-mentioned -- the projections 41 and 42 of two which the damper 36 prepared up and down fit into the \*\*\*\*\* stomata 65 and 66. Inside a frame 27, a stopper 67 is fixed with two screw threads 68 and 69. Like the above-mentioned, the projection 40 of a damper 36 contacted the stopper 67, and the overspeed r.p.m. of the camera head section 5 is prevented. A damper 36 is made to insert in the hole 86 which opened the projection 85 on the back in the side face of the head case 15, and makes in agreement the center of rotation of the head case 15, and the center of rotation of a damper 36.

[0022] Drawing 7 shows the sectional view which combined the absorber 36 and the image changeover switch 60. A damper 36 consists of the damper case 70, the rotation section 71, O ring 72, and damping oil 73. The damper case 70 has projections 41 and 42. The rotation section 71 consists of the disk section 74 and a shaft 39. Damping oil 73 is poured in between the disk section 74 and the damper case 70, and O ring 72 is carrying out the sealing device of damping oil 73. The circumference of the disk section 74 has fitted into the damping case 70, and is supported pivotable. The image changeover switch 60 consists of change switch casing 75 and the switch rotation section 76. the change switch casing 75 has projection 61 at a tooth back, and a stoma 64 should put it on in a front face at projection 61 and the same axle -- in a \*\*\*\*\* cage and the space section 77, the radii-like conductors 78 and 79 (refer to drawing 8) have fixed. stomata 65 and 66 should put on to a periphery at the switch rotation section 76 -- in \*\*\*\* and a rear face, the slide member 80 which consists of a conductive ingredient has fixed. The stoma 64 has two parallel flat surfaces, and the shaft 39 of the damper 36 which has two parallel flat surfaces fits in. Therefore, since the change switch casing 74 is being fixed to the frame 27, the rotation section 71 does not rotate but the damper case 70 rotates it relatively. Moreover, the switch rotation section 76 will rotate, a slide member 80 will slide on a conductor 78 and 79 top, and the projections 41 and 42 of two of the absorber case 70 will perform a switch change, if it fits into two stomata 65 and 66 of the switch rotation section 76 and an absorber 36 rotates.

[0023] Drawing 8 shows the pattern Fig. of the conductors 78 and 79 of the image changeover switch 60. An arrow head 81 shows the direction of an optical axis of a lens 32. An arrow head 81 is interlocked with, it rotates, and a slide member 80 is intermittent in conductors 78 and 79. A conductor 78 shows the pattern of the shape of an inside circular ring, and has a terminal 82. A conductor 79 shows the pattern of the shape of outside radii, and consists of two parts, narrow partial (75 include angles which radii make) 79a of arrow-head 81 direction, and other large partial (165 include angles which radii make) 79b. Narrow partial (75 include angles which radii make) 79b has a terminal 83, and large partial (165 include angles which radii make) 79a has a terminal 84. Among drawing, the direction which the arrow head 81 has turned to shows the condition which showed in drawing 1 or drawing 3, and shows the condition that the photography hole 17 of a video camera 5 has turned to the liquid crystal display 7, i.e., front-face of case 2a, side. At this time, a video camera 22 is in an erection condition.

[0024] Drawing 10 of drawing 9 of drawing 8 is each explanatory view of drawing 3 of operation. That is, as drawing 2 explained, it is the case where the photographic subject which shows the condition of having rotated the camera head section 5 and having turned the photography hole 17 (arrow head 81) to tooth-back 2b, and exists ahead of a photography person is photoed. Since the video camera 22 rotated 180 degrees to the circumference of a horizontal axis, it is in a handstand condition. however, the slide member 80 -- a conductor 78 and a conductor -- the switch-on of 79a to the conductor 78, and a conductor -- since it changes to the switch-on of 79b, the video signal with which a video camera 22 is outputted from a video camera 22 also in the state of a handstand serves as an erection image. About the approach of changing a handstand image into an erection image, it mentions later.

[0025] Drawing 12 of drawing 11 of drawing 8 is each explanatory view of drawing 3 of operation. Drawing 11 shows the condition that the arrow head 81 turned to right under, i.e., the case 2 interior. As drawing 12 shows, the photography hole 17 of the camera head section 5 shows the condition that turn to right under, i.e., the body case 3 interior, and the body case 3 covers. This shows the condition or storing condition which is not used. Since the photography hole 17 is covered in the body case 3, a lens 32 (refer to drawing 4) does not become dirty with dust. The slide member 80 touches only the conductor 78 and does not touch a conductor 79. That is,

the condition that the switch of the whole system of image pick-up equipment was turned off is shown.

[0026] Drawing 13 shows the conventional example of an image sensor 33, and is the basic block diagram of an INTARAIN transfer mold CCD image sensor with most examples of utilization. the photodiode whose 101 is a photo detector, and 102 -- the perpendicular transfer CCD (Charge Coupled Device) and 103 -- for the read-out gate and 106, as for a transfer gate pulse and 108, output amplifier and 107 are [ the transfer gate and 104 / the level transfer CCD and 105 / a read-out clock pulse and 109 ] signal outputs.

[0027] The photodiode 101 is perpendicularly arranged by the single tier, the perpendicular transfer CCD 102 of dedication is arranged between the train of a photodiode 101, and the train of a photodiode 101 at each photodiode 101, and the photodiode 101 and the perpendicular transfer CCD 102 are connected with the electrode. If light shines upon a photodiode 101, a charge will be generated in a photodiode 101. If the transfer gate pulse 107 is inputted from the transfer gate 103 at a vertical-retrace-line period, the charge of all the photodiodes 101 will move out next, respectively, and will move to the perpendicular transfer CCD 102. The signal of the perpendicular transfer CCD 102 is transmitted one step at a time downward for every horizontal scanning. The signal by which it came to the level transfer CCD 104 of a lower limit was inputted into the read-out gate 105, is read, it is transmitted to the direction of the right one after another, goes, is amplified by the clock pulse 108 with the output amplifier 106, and serves as the signal output 109 by it.

[0028] Drawing 14 shows the basic block diagram of the INTARAIN transfer mold CCD image sensor which is the 1st example of this invention of an image sensor 33. The photodiode whose 110 is a photo detector, and 111 The perpendicular transfer CCD 112 the 1st level transfer CCD and 114 for the transfer gate and 113 The 1st read-out gate, 115 a transfer gate pulse and 117 for the 1st output amplifier and 116 The 1st read-out clock pulse, For the 2nd read-out gate and 121, as for the 2nd output amplifier and 123, the 2nd read-out clock pulse and 122 are [ the signal output whose 118 is the 1st and 119 / the 2nd level transfer CCD and 120 / the 2nd signal output and 124 ] the 1st signal output changeover switch.

[0029] If light shines upon a photodiode 110, a charge will be generated in a photodiode 110. If the transfer gate pulse 116 is inputted from the transfer gate 112 at a vertical-retrace-line period, the charge of all the photodiodes 110 will move out next, respectively, and will move to the perpendicular transfer CCD 111. Whether it transmits one step at a time the signal of the perpendicular transfer CCD 111 up for every horizontal scanning or it transmits caudad input the transfer gate pulse 116 from a lower part, it inputs it from the upper part, or the direction is determined. The transfer gate pulse 116 is generated with the microcomputer (not shown) which determines the driving pulse generating circuit (not shown) connected to the transfer gate 112, and its input direction. If a microcomputer sets up the input direction caudad, the signal of the perpendicular transfer CCD 111 will be transmitted one step at a time downward for every horizontal scanning. The signal by which it came to the 1st level transfer CCD 113 of a lower limit is transmitted one after another to the direction of the right by the 1st read-out clock pulse 117 inputted into the 1st read-out gate 114, goes by it, is amplified with the 1st output amplifier 115, and serves as the 1st signal output 118. On the other hand, if a microcomputer sets up the input direction up, the signal of the perpendicular transfer CCD 111 will be transmitted one step at a time upwards for every horizontal scanning. The signal by which it came to the 2nd level transfer CCD 119 of upper limit is transmitted one after another to the method of the right by the 2nd read-out clock pulse 121 inputted into the 2nd read-out gate 120, goes by it, is amplified with the 2nd output amplifier 122, and serves as the signal output 123. The 1st signal output 118 and the 2nd signal output 123 are changed with the 1st signal output changeover switch 124. A change with the 1st signal changeover switch 124 is performed by the image changeover switch 60 shown by drawing 8 being interlocked with. That is, when the video camera 22 turned to the direction of front-face of case 2a, it has stood erect, a slide member 80 contacts Conductors 78 and 79b and Conductors 78 and 79b are in switch-on, as shown in drawing 14, it connects with the signal output 118 side, and the 1st signal output changeover switch 124 outputs the signal of the 1st output amplifier 115 used as an erection image. When the video camera 22 turned to the case tooth-back 2b direction on the contrary, a handstand is done, a slide member 80 contacts Conductors 78 and 79a and Conductors 78 and 79a are in switch-on, it connects with the signal output 123 side, and the 1st signal output changeover switch 124 outputs the signal of the 2nd output amplifier 122 used as a handstand image. Therefore, if a handstand image is outputted from the video camera 22 which has done a handstand, the image will turn into an erection image and will be displayed on a liquid crystal display 7.

[0030] Drawing 15 shows the basic block diagram of the INTARAIN transfer mold CCD image sensor which is the 2nd example of this invention of an image sensor 33. The photodiode whose 110 is a photo detector, and 111 The perpendicular transfer CCD 112 the 1st level transfer CCD and 114 for the transfer gate and 113 The

1st read-out gate, 115 a transfer gate pulse and 117 for the 1st output amplifier and 116 The 1st read-out clock pulse, 118 the 2nd level transfer CCD and 120 for the 1st signal output and 119 The 2nd read-out gate, The 2nd read-out clock pulse and 122 121 The 2nd output amplifier, The 2nd signal output and 124 123 The 1st signal output changeover switch, For the 3rd signal output and 127, as for the 4th signal output and 129, the 4th output amplifier and 128 are [ 125 / the 3rd output amplifier and 126 / the 2nd signal changeover switch and 130 ] the 3rd signal changeover switch.

[0031] If light shines upon a photodiode 110, a charge will be generated in a photodiode 110. If the transfer gate pulse 116 is inputted from the transfer gate 112 at a vertical-retrace-line period, the charge of all the photodiodes 110 will move out next, respectively, and will move to the perpendicular transfer CCD 111.

Whether it transmits one step at a time the signal of the perpendicular transfer CCD 111 up for every horizontal scanning or it transmits caudad input the transfer gate pulse 116 from a lower part, it inputs it from the upper part, or the direction is determined. The transfer gate pulse 116 is generated with the microcomputer (not shown) which determines the driving pulse generating circuit (not shown) connected to the transfer gate 112, and its input direction. The signal by which it came to the 1st level transfer CCD 113 of a lower limit or the 2nd level transfer CCD 119 of upper limit It is horizontally transmitted one after another by the 2nd read-out clock pulse 121 inputted into the 1st read-out clock pulse 117 inputted into the 1st read-out gate 114, or the 2nd read-out gate 120, and goes by it. It is amplified with the 1st thru/or 4th output amplifier 115, 122, 125, 127, and becomes the signal output 118, 123, 126, 128, respectively. As for the signal output 118 and the signal output 123, the 1st is changed signal output changeover switch 124. The signal output 126 and the signal output 128 are changed with the 2nd signal output changeover switch 129. A change with the 1st signal output changeover switch 124 or the 2nd signal output changeover switch 129 is performed by the image changeover switch 60 being interlocked with. That is, when the video camera 22 turned to the direction of front-face of case 2a, it has stood erect, a slide member 80 contacts Conductors 78 and 79b and Conductors 78 and 79b are in switch-on, as shown in drawing 15, it connects with the signal output 118 or signal output 126 side, and the 1st signal output changeover switch 124 or the 2nd signal output changeover switch 129 outputs the signal of the 1st output amplifier 115 used as an erection image, or the 3rd output amplifier 125. When the video camera 22 turned to the case tooth-back 2b direction on the contrary, a handstand is done, a slide member 80 contacts Conductors 78 and 79a and Conductors 78 and 79a are in switch-on, it connects with the signal output 123 or signal output 128 side, and the 1st signal output changeover switch 124 or the 2nd signal output changeover switch 129 outputs the signal of the 2nd output amplifier 122 used as a handstand image, or the 4th output amplifier 127. Therefore, if a handstand image is outputted from the video camera 22 which has done a handstand, the image will turn into an erection image and will be displayed on a liquid crystal display 7.

[0032] On the other hand, the signal by which it came to the 1st level transfer CCD 113 of a lower limit or the 2nd level transfer CCD 119 of upper limit in the output amplifier 115 (or 2nd output amplifier 122) direction of the 1st Or whether it goes in the output amplifier 125 (or 4th output amplifier 127) direction of the 3rd inputs the 1st read-out clock pulse 117 or the 2nd read-out clock pulse 121 from a left, it inputs it from the method of the right, or the direction is determined. The 1st read-out clock pulse 117 or the 2nd read-out clock pulse 121 is generated with the microcomputer (not shown) which determines the driving pulse generating circuit (not shown) connected to the 1st read-out gate 114 and the 2nd read-out gate 120, and its input direction. Right and left of the 1st signal output 118 or the 2nd signal output 123 are a right real image. That is, the 1st signal output 118 is an erection real image, and the 2nd signal output 123 is a handstand real image. On the other hand, the 3rd signal output 126 or the 4th signal output 128 is the mirror image which right and left reversed. That is, the 3rd signal output 126 is an erection mirror image, and the 4th signal output 128 is a handstand mirror image. Whether a final signal output is made into a real image or a mirror image changes with the 3rd signal changeover switch 130. The 3rd signal changeover switch 130 can be performed by operating the feature buttons 19 and 20 prepared in the manual operation button 9.

[0033] Drawing 16 shows the 3rd example of this invention, and expresses an MOS type pickup device as an image sensor 33 which can change an inverted image into an erect image. The photodiode and the perpendicular switching transistor (MOS-FET: Metal Oxide Silicon) are included in two or more light-receiving units 201 which constitute the photoelectric surface 200, and the signal ejection for every light-receiving unit 201 is possible for an MOS type pickup device. The upper part of the light-receiving unit 201 is connected to the level shift register 203 through the level switching transistor (MOS-FET) 202, and the perpendicular shift register 204 is connected to the side face of the light-receiving unit 201. A level switching transistor is connected with the output amplifier 205, amplifies the output of the light-receiving unit 201 chosen with the level shift register

203 and the perpendicular shift register 204, and outputs a signal to the signal output terminal 206. There are the forward direction terminal 207 and the KU hard flow terminal 208 which input a clock pulse into the level shift register 203, by changing the input direction of a clock pulse with a changeover switch 209, the scanning direction of the level shift register 203 is changed, and conversion of a real image and a mirror image is performed. Moreover, there are the forward direction terminal 210 and the hard flow terminal 211 which input a clock pulse into the perpendicular shift register 204, by changing the input direction of a clock pulse with a changeover switch 212, the scanning direction of the perpendicular shift register 204 is changed, and conversion of an erect image and an inverted image is performed.

[0034] Actuation of a changeover switch 209 is performed by operating the feature buttons 19 and 20 prepared in the manual operation button 9 shown in drawing 1 . If the changeover switch 209 is connected to the forward direction terminal 207 as shown in drawing 16 , and a real image is displayed on a liquid crystal display 7 and connected to the hard flow terminal 208, a mirror image will be displayed on a liquid crystal display 7.

[0035] Actuation of a changeover switch 212 is performed by the image changeover switch 60 being interlocked with. That is, when the video camera 22 turned to the direction of front-face of case 2a, it has stood erect, a slide member 80 contacts Conductors 78 and 79b and Conductors 78 and 79b are in switch-on, as shown in drawing 16 , it connects with the forward direction terminal 210, and a changeover switch 212 outputs an erection image from the output amplifier 205. When the video camera 22 turned to the case tooth-back 2b direction on the contrary, a handstand is done, a slide member 80 contacts Conductors 78 and 79a and Conductors 78 and 79a are in switch-on, it connects with the hard flow terminal 208 side, and a changeover switch 209 outputs a handstand image from the output amplifier 205. Therefore, if a handstand image is outputted from the video camera 22 which has done a handstand, the image will turn into an erection image and will be displayed on a liquid crystal display 7.

[0036]

[Effect of the Invention] Since the effectiveness of this invention formed the inverted-image readout means in the image sensor of a video camera itself, even if it does not rotate a case, it can obtain an erect image easily. That is, since an erect-image read-out means and an inverted-image read-out means are changed according to the angular position of a video camera, it can consider as an erect image automatically and can prevent recording an inverted image or transmitting accidentally.

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[Translation done.]



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TECHNICAL FIELD

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[Industrial Application] This invention relates to the portable image pick-up equipment which adjusts the include angle of a video camera and photos a photographic subject, while the portable image pick-up equipment with which the video camera was equipped as image photography equipment, and it was equipped with the flat-surface display of a direct viewing type as a graphic display device is started, especially a photography person acts as a monitor on a flat-surface display. There is an electronic "still" camera which has a VTR one apparatus video camera, solid-state memory, and a video floppy as this kind of portable image pick-up equipment.

[0002] Moreover, a camera one apparatus personal digital assistant (PDA:Personal Data Assistant), a camera one apparatus cellular phone, etc. are proposed newly.

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**PRIOR ART**

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[Description of the Prior Art] As this kind of portable image pick-up equipment, "the camcorder/movie with monitor TV" of an indication is in JP,4-6154,B conventionally. the image pick-up equipment of the indication to JP,4-6154,B -- the VTR section and the monitor TV section -- a case -- dedicating -- as one -- constituting -- the video camera section -- the right lateral of a case -- it supports to revolve pivotable centering on a horizontal shaft into a central part mostly. This camcorder/movie is held so that the whole equipment may be supported with the right hand or the monitor section may carry out a right pair (a photography person's look is to the flat surface of the monitor section) to a photography person with a case with the left hand, it has the video camera section with the right hand, by twisting this video camera section to the monitor section, a video camera inclines, and is changed and photos a photographic subject.

[0004] Moreover, VTR and a liquid crystal display are made Etsuo etc. Hoshikawa etc. on left-hand side at one "high-definition MS movie VL-HL1" (the Sharp technical report No. 54 and November, 1992 pp 67-70), and the image pick-up equipment which supported both of each other to revolve pivotable is carried.

[0005] The video camera section is rotated 180 degrees, these types of image pick-up equipment can be turned in the same direction as the monitor section, and the photography person was able to photo himself. Generally, when photoing the photographic subject which is ahead of a photography person, the video camera is set so that top and bottom may be photoed normally. Therefore, as for a display image or a record image, a handstand image will be displayed or recorded, when a video camera is rotated 180 degrees centering on a horizontal axis and a video camera is made a handstand. then, these types of image pick-up equipment -- using -- top and bottom -- the approach of turning a video camera to the photography person itself first (a video camera standing erect), carrying out rotation (a monitor doing a handstand) of the monitor 180 degrees, and subsequently to centering on a horizontal axis turning him to the photography person itself in order to acquire a normal record image (erection image) -- adoption \*\*\*\*\*. Since a monitor's display would be an inverted image at this time, a monitor's perpendicular direction scan was reversed and the erection image had been acquired.

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EFFECT OF THE INVENTION

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[Effect of the Invention] Since the effectiveness of this invention formed the inverted-image readout means in the image sensor of a video camera itself, even if it does not rotate a case, it can obtain an erect image easily. That is, since an erect-image read-out means and an inverted-image read-out means are changed according to the angular position of a video camera, it can consider as an erect image automatically and can prevent recording an inverted image or transmitting accidentally.

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**TECHNICAL PROBLEM**

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[Problem(s) to be Solved by the Invention] Since the above-mentioned conventional example is the method which is made to reverse a monitor's perpendicular direction scan and obtains an erect image, when a video camera turns to a value monitor screen side, an erection image is displayed on a monitor regardless of erection or handstand of a video camera always. That is, since a monitor's direction of a vertical scanning is reversed even if it holds a video camera in the erection condition and makes a monitor side do a handstand, even if an erection image is displayed on a monitor, it holds a video camera in the handstand condition on the contrary and it erects a monitor side, vertical reversal of the handstand image input of a video camera is carried out by the monitor, and an erection image is displayed. that is, -- whether it does a handstand in a video camera side or does a handstand in a monitor side on the contrary -- a monitor -- always -- top and bottom -- a normal image will be displayed. Therefore, a photography person cannot judge whether a handstand should be done in the thing which should just do a handstand in a video camera, or a monitor only by seeing the image displayed on the monitor. It is the right that erect a video camera in order to always record an erection image, since the photography image of a video camera is recorded on record devices, such as VTR, as it is, and a monitor does a handstand. However, it is the operation which is held so that the right pair of the monitoring screen may usually be carried out to a photography person at the time of photography, changes the include angle of a video camera, and follows a photographic subject. Therefore, also when photoing the photography person itself, the extension is considered, a monitor is held as it is, and the case where rotate 180 degrees, make the video camera itself do a handstand, and a photograph is taken occurs. In this case, there was a problem that a handstand image will be recorded in a record device.

[0007] Moreover, like this invention, neither with a camera one apparatus personal digital assistant (PDA) nor a camera one apparatus cellular phone, since a telephone number manual operation button is arranged at a graphic display side case and an alphabetic character is displayed on a monitor, a monitor can be used, doing a handstand. Then, when a video camera does a handstand, it will be necessary to erection-ize a handstand image.

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**MEANS**

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[Means for Solving the Problem] In order to solve the technical problem of the above-mentioned conventional example or a new proposal product, a location detection means to detect that the video camera turned to the monitor side was established in the case, and the video camera consisted of image sensors which have a handstand read-out means with an erection read-out means.

[0009] When an image sensor is CCD series, specifically, it is the level transfer CCD of the lot by which the erection read-out means or the handstand read-out means was formed in the upper part or the lower part of the perpendicular transfer CCD and a photodiode.

[0010] Moreover, when said image sensors are MOS mold image sensors, an erection read-out means or a vertical reversal read-out means is a scanning direction change means of the vertical-scanning shift register of MOS mold image sensors.

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**OPERATION**

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[Function] Since the above-mentioned erection read-out means of the above-mentioned image sensor and the above-mentioned handstand read-out means are changed so that the image displayed on a graphic display means may turn into an erect image according to the signal of the above-mentioned signal detection means, even if a video camera rotates centering on the horizontal axis which becomes settled uniquely with a graphic display means, the image displayed on a graphic display means always turns into an erect image with regards to the sense of a video camera that there is nothing.

[0012] The level transfer CCD arranged in the perpendicular transfer CCD of CCD series and the upper part (or lower part) of a photodiode transmits at a time one step of charge of the photodiode sent from the perpendicular transfer CCD, and obtains an erect image. On the other hand, the level transfer CCD arranged at the lower part (or upper part) of the perpendicular transfer CCD and a photodiode transmits at a time one step of charge of the photodiode sent from the perpendicular transfer CCD, and obtains an inverted image. With regards to the direction which a video camera turns to, an erect image can always be obtained that there is nothing by operating one of the level transfers CCD arranged at the upper part or the lower part according to the signal of a signal detection means.

[0013] In the case of MOS mold image sensors, FET (field-effect transistor) is combined with each of photodiodes, a level shift register and a perpendicular shift register are arranged around the light sensing portion which consists of a photodiode put in order in all directions and FET, and the charge of the photodiode of arbitration can be taken out by controlling the pulse for a scan sent into these shift registers. [ two or more ] Moreover, the image which reversed the pulse for a scan according to the direction inputted into a shift register can be obtained. That is, if the pulse for a scan is sent into a horizontal scanning shift register from usual and an opposite direction, a mirror image image will be obtained, and a handstand image will be obtained if the pulse for a scan is sent into a vertical-scanning shift register from usual and an opposite direction.

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**EXAMPLE**

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[Example] One example of this invention is shown in drawing 1 and drawing 2. Drawing 1 shows the appearance perspective view whose front 2a of portable image pick-up equipment 1 can be seen, and drawing 2 shows the appearance perspective view whose tooth-back 2b can be seen.

[0015] Portable image pick-up equipment 1 supports the camera head section 5 to revolve pivotable in the center of the rising wood 4 of the body case 3, an antenna 6 is arranged in the left corner section of the body case 3, a liquid crystal display 7, a loudspeaker 8, and a manual operation button 9 are arranged at front 2a of the body case 3, a microphone 11 and a dc-battery 12 are formed, and, as for the left lateral 10 of the body case 3, the microphone 14 is arranged at the right lateral 13 of the body case 3. The front face of the head case 15 was engraved with the knurling tool 16 for skids, and the photography hole 17 has opened the camera head section 5. A manual operation button 9 consists of dial carbon buttons 18 from 0 to 9 for inputting the telephone number, and bottom feature buttons 20, such as the top feature buttons 19, such as an abbreviated dialing function and a redial function, and dispatch, and termination.

[0016] Drawing 1 shows the condition of having turned the camera head section 5 to front-face of body case 3 2a, and displays the photographic subject in the operator or front 2a side on the screen of a liquid crystal display 7. Since it supported to revolve pivotable to the hand of cut 21 which sets a revolving shaft as a shaft parallel to horizontally it becomes settled uniquely with a liquid crystal display 7 in parallel with rising wood 4 about the camera head section 5 in the rising wood 4 of the body case 3, the body case 3 can be supported with the left hand, and a liquid crystal display 7 can be held at a legible include angle, and by the right thumb and a right forefinger, the camera head section 5 can be pinched, it can rotate, and whenever [ angle-of-coverage / of the camera head section 5 ] can be set up.

[0017] Drawing 2 is a busy condition in the case of photoing the photographic subject which shows the condition of having rotated the camera head section 5 and having turned to tooth-back 2b, and exists ahead of a photography person. A liquid crystal display 7 acts as an electronic view finder, and records the displayed image on the memory (not shown) and the recording device (not shown) of the body case 3 interior, or transmits it directly.

[0018] The internal structure of portable image pick-up equipment 1 is shown in drawing 3 and drawing 4.

[0019] Drawing 3 is the A-A sectional view of drawing 1, and drawing 4 is the internal configuration perspective view of drawing 1. It explains referring to drawing 3 and drawing 4. Inside the head case 15, the video camera 22 is arranged in the state of erection. Under the camera head section 5, it consists of a liquid crystal display 7, a loudspeaker 8, a manual operation button 9, a power circuit and the voice substrate 23, the RF (Radio Frequency) substrate 24, video camera signal processing and a liquid crystal display substrate 25, memory, a control substrate 26, etc. the frame 27 shown in drawing 4 should carry out axial support of the head case 15 at good rotation, and a stoma 28 should put it on to one side -- the ring 30 which has an osculum 29 is put on \*\*\*\* and another side. The video camera 22 shown in drawing 4 is in the condition which removed the head case 15, and is \*\*\*\*\*. A video camera 22 consists of a shutter 31, a lens 32, an image sensor 33, and the image sensor circuit board 34, and if a shutter 31 opens, the image of a photographic subject will carry out image formation of it to an image sensor 33 with a lens 32. Connection of the image sensor circuit board 34, video camera signal processing, and the liquid crystal display substrate 25 is carried out by the flexible cable 35. The flexible cable 35 is wound around the coiled form, and it considers the osculum 29 neighborhood so that a crease may occur on the flexible cable 35 and may not twist and go out on it, even if a video camera 22 rotates.

[0020] The external view of the camera head section 5 is shown in drawing 5. The damper 36 is being fixed to

the right lateral of the head case 15 with two screw threads 37 and 38. The shaft 39 of a damper 36 is in agreement with the center of rotation of the head case 15, and has two flat surfaces parallel to the side face of a shaft 39. The about 38 screw thread [ of a damper 36 ] projection 40 prevents the overspeed r.p.m. of the camera head section 5 in contact with the stopper 67 (refer to drawing 6 ) which prepared in the frame 27. The camera head section 5 of this example is designed pivotable 240 abbreviation. The projections 41 and 42 of two which the absorber 36 prepared up and down fit in, respectively with the stomata 65 and 66 dug to the image changeover switch 60 (refer to drawing 6 ), and carry out the duty which rotates the image changeover switch 60.

[0021] Drawing 6 shows the decomposition block diagram of the camera head section 5. The head case 15 consists of case anterior part 43 and a case posterior part 44, and two cases are combined by twisting tapping screws 49, 50, 51, and 52 into four columns 45, 46, 47, and 48 really fabricated by the case anterior part 43. A video camera 22 uses four screw threads 53, 54, 55, and 56 for four columns 45, 46, 47, and 48, and fixes to them the image sensor circuit board 34 constituted by one. Two tapped holes can fix a \*\*\*\*, the case posterior part 44, and the image sensor circuit board 34 to four columns 45, 46, 47, and 48 at a time, respectively. There are cylinder parts 57 and 58 of a semicircle in the left lateral of the case anterior part 43 and the case posterior part 44, and the case anterior part 43 and the case posterior part 44 are put together to one, serve as a cylinder, and fit into the osculum 29 of a frame 27. The projection 61 (refer to drawing 7 ) of the image changeover switch 60 fits into the stoma 28 of a frame 27, the image changeover switch 60 is positioned, and the image changeover switch 60 is fixed with two screw threads 62 and 63. a stoma 64 should put on in the core of the image changeover switch 60 -- the shaft 39 of \*\*\*\* and a damper 36 fits in. moreover, the image changeover switch 60 should put on up and down like the above-mentioned -- the projections 41 and 42 of two which the damper 36 prepared up and down fit into the \*\*\*\*\* stomata 65 and 66. Inside a frame 27, a stopper 67 is fixed with two screw threads 68 and 69. Like the above-mentioned, the projection 40 of a damper 36 contacted the stopper 67, and the overspeed r.p.m. of the camera head section 5 is prevented. A damper 36 is made to insert in the hole 86 which opened the projection 85 on the back in the side face of the head case 15, and makes in agreement the center of rotation of the head case 15, and the center of rotation of a damper 36.

[0022] Drawing 7 shows the sectional view which combined the absorber 36 and the image changeover switch 60. A damper 36 consists of the damper case 70, the rotation section 71, O ring 72, and damping oil 73. The damper case 70 has projections 41 and 42. The rotation section 71 consists of the disk section 74 and a shaft 39. Damping oil 73 is poured in between the disk section 74 and the damper case 70, and O ring 72 is carrying out the sealing device of damping oil 73. The circumference of the disk section 74 has fitted into the damping case 70, and is supported pivotable. The image changeover switch 60 consists of change switch casing 75 and the switch rotation section 76. the change switch casing 75 has projection 61 at a tooth back, and a stoma 64 should put it on in a front face at projection 61 and the same axle -- in a \*\*\*\*\* cage and the space section 77, the radii-like conductors 78 and 79 (refer to drawing 8 ) have fixed. stomata 65 and 66 should put on to a periphery at the switch rotation section 76 -- in \*\*\*\* and a rear face, the slide member 80 which consists of a conductive ingredient has fixed. The stoma 64 has two parallel flat surfaces, and the shaft 39 of the damper 36 which has two parallel flat surfaces fits in. Therefore, since the change switch casing 74 is being fixed to the frame 27, the rotation section 71 does not rotate but the damper case 70 rotates it relatively. Moreover, the switch rotation section 76 will rotate, a slide member 80 will slide on a conductor 78 and 79 top, and the projections 41 and 42 of two of the absorber case 70 will perform a switch change, if it fits into two stomata 65 and 66 of the switch rotation section 76 and an absorber 36 rotates.

[0023] Drawing 8 shows the pattern Fig. of the conductors 78 and 79 of the image changeover switch 60. An arrow head 81 shows the direction of an optical axis of a lens 32. An arrow head 81 is interlocked with, it rotates, and a slide member 80 is intermittent in conductors 78 and 79. A conductor 78 shows the pattern of the shape of an inside circular ring, and has a terminal 82. A conductor 79 shows the pattern of the shape of outside radii, and consists of two parts, narrow partial (75 include angles which radii make) 79a of arrow-head 81 direction, and other large partial (165 include angles which radii make) 79b. Narrow partial (75 include angles which radii make) 79b has a terminal 83, and large partial (165 include angles which radii make) 79a has a terminal 84. Among drawing, the direction which the arrow head 81 has turned to shows the condition which showed in drawing 1 or drawing 3 , and shows the condition that the photography hole 17 of a video camera 5 has turned to the liquid crystal display 7, i.e., front-face of case 2a, side. At this time, a video camera 22 is in an erection condition.

[0024] Drawing 10 of drawing 9 of drawing 8 is each explanatory view of drawing 3 of operation. That is, as

drawing 2 explained, it is the case where the photographic subject which shows the condition of having rotated the camera head section 5 and having turned the photography hole 17 (arrow head 81) to tooth-back 2b, and exists ahead of a photography person is photoed. Since the video camera 22 rotated 180 degrees to the circumference of a horizontal axis, it is in a handstand condition. however, the slide member 80 -- a conductor 78 and a conductor -- the switch-on of 79a to the conductor 78, and a conductor -- since it changes to the switch-on of 79b, the video signal with which a video camera 22 is outputted from a video camera 22 also in the state of a handstand serves as an erection image. About the approach of changing a handstand image into an erection image, it mentions later.

[0025] Drawing 12 of drawing 11 of drawing 8 is each explanatory view of drawing 3 of operation. Drawing 11 shows the condition that the arrow head 81 turned to right under, i.e., the case 2 interior. As drawing 12 shows, the photography hole 17 of the camera head section 5 shows the condition that turn to right under, i.e., the body case 3 interior, and the body case 3 covers. This shows the condition or storing condition which is not used. Since the photography hole 17 is covered in the body case 3, a lens 32 (refer to drawing 4) does not become dirty with dust. The slide member 80 touches only the conductor 78 and does not touch a conductor 79. That is, the condition that the switch of the whole system of image pick-up equipment was turned off is shown.

[0026] Drawing 13 shows the conventional example of an image sensor 33, and is the basic block diagram of an INTARAIN transfer mold CCD image sensor with most examples of utilization. the photodiode whose 101 is a photo detector, and 102 -- the perpendicular transfer CCD (Charge Coupled Device) and 103 -- for the read-out gate and 106, as for a transfer gate pulse and 108, output amplifier and 107 are [ the transfer gate and 104 / the level transfer CCD and 105 / a read-out clock pulse and 109 ] signal outputs.

[0027] The photodiode 101 is perpendicularly arranged by the single tier, the perpendicular transfer CCD 102 of dedication is arranged between the train of a photodiode 101, and the train of a photodiode 101 at each photodiode 101, and the photodiode 101 and the perpendicular transfer CCD 102 are connected with the electrode. If light shines upon a photodiode 101, a charge will be generated in a photodiode 101. If the transfer gate pulse 107 is inputted from the transfer gate 103 at a vertical-retrace-line period, the charge of all the photodiodes 101 will move out next, respectively, and will move to the perpendicular transfer CCD 102. The signal of the perpendicular transfer CCD 102 is transmitted one step at a time downward for every horizontal scanning. The signal by which it came to the level transfer CCD 104 of a lower limit was inputted into the read-out gate 105, is read, it is transmitted to the direction of the right one after another, goes, is amplified by the clock pulse 108 with the output amplifier 106, and serves as the signal output 109 by it.

[0028] Drawing 14 shows the basic block diagram of the INTARAIN transfer mold CCD image sensor which is the 1st example of this invention of an image sensor 33. The photodiode whose 110 is a photo detector, and 111 The perpendicular transfer CCD 112 the 1st level transfer CCD and 114 for the transfer gate and 113 The 1st read-out gate, 115 a transfer gate pulse and 117 for the 1st output amplifier and 116 The 1st read-out clock pulse, For the 2nd read-out gate and 121, as for the 2nd output amplifier and 123, the 2nd read-out clock pulse and 122 are [ the signal output whose 118 is the 1st and 119 / the 2nd level transfer CCD and 120 / the 2nd signal output and 124 ] the 1st signal output changeover switch.

[0029] If light shines upon a photodiode 110, a charge will be generated in a photodiode 110. If the transfer gate pulse 116 is inputted from the transfer gate 112 at a vertical-retrace-line period, the charge of all the photodiodes 110 will move out next, respectively, and will move to the perpendicular transfer CCD 111. Whether it transmits one step at a time the signal of the perpendicular transfer CCD 111 up for every horizontal scanning or it transmits caudad input the transfer gate pulse 116 from a lower part, it inputs it from the upper part, or the direction is determined. The transfer gate pulse 116 is generated with the microcomputer (not shown) which determines the driving pulse generating circuit (not shown) connected to the transfer gate 112, and its input direction. If a microcomputer sets up the input direction caudad, the signal of the perpendicular transfer CCD 111 will be transmitted one step at a time downward for every horizontal scanning. The signal by which it came to the 1st level transfer CCD 113 of a lower limit is transmitted one after another to the direction of the right by the 1st read-out clock pulse 117 inputted into the 1st read-out gate 114, goes by it, is amplified with the 1st output amplifier 115, and serves as the 1st signal output 118. On the other hand, if a microcomputer sets up the input direction up, the signal of the perpendicular transfer CCD 111 will be transmitted one step at a time upwards for every horizontal scanning. The signal by which it came to the 2nd level transfer CCD 119 of upper limit is transmitted one after another to the method of the right by the 2nd read-out clock pulse 121 inputted into the 2nd read-out gate 120, goes by it, is amplified with the 2nd output amplifier 122, and serves as the signal output 123. The 1st signal output 118 and the 2nd signal output 123 are changed with the 1st signal

output changeover switch 124. A change with the 1st signal changeover switch 124 is performed by the image changeover switch 60 shown by drawing 8 being interlocked with. That is, when the video camera 22 turned to the direction of front-face of case 2a, it has stood erect, a slide member 80 contacts Conductors 78 and 79b and Conductors 78 and 79b are in switch-on, as shown in drawing 14, it connects with the signal output 118 side, and the 1st signal output changeover switch 124 outputs the signal of the 1st output amplifier 115 used as an erection image. When the video camera 22 turned to the case tooth-back 2b direction on the contrary, a handstand is done, a slide member 80 contacts Conductors 78 and 79a and Conductors 78 and 79a are in switch-on, it connects with the signal output 123 side, and the 1st signal output changeover switch 124 outputs the signal of the 2nd output amplifier 122 used as a handstand image. Therefore, if a handstand image is outputted from the video camera 22 which has done a handstand, the image will turn into an erection image and will be displayed on a liquid crystal display 7.

[0030] Drawing 15 shows the basic block diagram of the INTARAIN transfer mold CCD image sensor which is the 2nd example of this invention of an image sensor 33. The photodiode whose 110 is a photo detector, and 111 The perpendicular transfer CCD 112 the 1st level transfer CCD and 114 for the transfer gate and 113 The 1st read-out gate, 115 a transfer gate pulse and 117 for the 1st output amplifier and 116 The 1st read-out clock pulse, 118 the 2nd level transfer CCD and 120 for the 1st signal output and 119 The 2nd read-out gate, The 2nd read-out clock pulse and 122 121 The 2nd output amplifier, The 2nd signal output and 124 123 The 1st signal output changeover switch, For the 3rd signal output and 127, as for the 4th signal output and 129, the 4th output amplifier and 128 are [ 125 / the 3rd output amplifier and 126 / the 2nd signal changeover switch and 130 ] the 3rd signal changeover switch.

[0031] If light shines upon a photodiode 110, a charge will be generated in a photodiode 110. If the transfer gate pulse 116 is inputted from the transfer gate 112 at a vertical-retrace-line period, the charge of all the photodiodes 110 will move out next, respectively, and will move to the perpendicular transfer CCD 111.

Whether it transmits one step at a time the signal of the perpendicular transfer CCD 111 up for every horizontal scanning or it transmits caudad input the transfer gate pulse 116 from a lower part, it inputs it from the upper part, or the direction is determined. The transfer gate pulse 116 is generated with the microcomputer (not shown) which determines the driving pulse generating circuit (not shown) connected to the transfer gate 112, and its input direction. The signal by which it came to the 1st level transfer CCD 113 of a lower limit or the 2nd level transfer CCD 119 of upper limit It is horizontally transmitted one after another by the 2nd read-out clock pulse 121 inputted into the 1st read-out clock pulse 117 inputted into the 1st read-out gate 114, or the 2nd read-out gate 120, and goes by it. It is amplified with the 1st thru/or 4th output amplifier 115, 122, 125, 127, and becomes the signal output 118, 123, 126, 128, respectively. As for the signal output 118 and the signal output 123, the 1st is changed signal output changeover switch 124. The signal output 126 and the signal output 128 are changed with the 2nd signal output changeover switch 129. A change with the 1st signal output changeover switch 124 or the 2nd signal output changeover switch 129 is performed by the image changeover switch 60 being interlocked with. That is, when the video camera 22 turned to the direction of front-face of case 2a, it has stood erect, a slide member 80 contacts Conductors 78 and 79b and Conductors 78 and 79b are in switch-on, as shown in drawing 15, it connects with the signal output 118 or signal output 126 side, and the 1st signal output changeover switch 124 or the 2nd signal output changeover switch 129 outputs the signal of the 1st output amplifier 115 used as an erection image, or the 3rd output amplifier 125. When the video camera 22 turned to the case tooth-back 2b direction on the contrary, a handstand is done, a slide member 80 contacts Conductors 78 and 79a and Conductors 78 and 79a are in switch-on, it connects with the signal output 123 or signal output 128 side, and the 1st signal output changeover switch 124 or the 2nd signal output changeover switch 129 outputs the signal of the 2nd output amplifier 122 used as a handstand image, or the 4th output amplifier 127. Therefore, if a handstand image is outputted from the video camera 22 which has done a handstand, the image will turn into an erection image and will be displayed on a liquid crystal display 7.

[0032] On the other hand, the signal by which it came to the 1st level transfer CCD 113 of a lower limit or the 2nd level transfer CCD 119 of upper limit in the output amplifier 115 (or 2nd output amplifier 122) direction of the 1st Or whether it goes in the output amplifier 125 (or 4th output amplifier 127) direction of the 3rd inputs the 1st read-out clock pulse 117 or the 2nd read-out clock pulse 121 from a left, it inputs it from the method of the right, or the direction is determined. The 1st read-out clock pulse 117 or the 2nd read-out clock pulse 121 is generated with the microcomputer (not shown) which determines the driving pulse generating circuit (not shown) connected to the 1st read-out gate 114 and the 2nd read-out gate 120, and its input direction. Right and left of the 1st signal output 118 or the 2nd signal output 123 are a right real image. That is, the 1st signal output



118 is an erection real image, and the 2nd signal output 123 is a handstand real image. On the other hand, the 3rd signal output 126 or the 4th signal output 128 is the mirror image which right and left reversed. That is, the 3rd signal output 126 is an erection mirror image, and the 4th signal output 128 is a handstand mirror image. Whether a final signal output is made into a real image or a mirror image changes with the 3rd signal changeover switch 130. The 3rd signal changeover switch 130 can be performed by operating the feature buttons 19 and 20 prepared in the manual operation button 9.

[0033] Drawing 16 shows the 3rd example of this invention, and expresses an MOS type pickup device as an image sensor 33 which can change an inverted image into an erect image. The photodiode and the perpendicular switching transistor (MOS-FET: Metal Oxide Silicon) are included in two or more light-receiving units 201 which constitute the photoelectric surface 200, and the signal ejection for every light-receiving unit 201 is possible for an MOS type pickup device. The upper part of the light-receiving unit 201 is connected to the level shift register 203 through the level switching transistor (MOS-FET) 202, and the perpendicular shift register 204 is connected to the side face of the light-receiving unit 201. A level switching transistor is connected with the output amplifier 205, amplifies the output of the light-receiving unit 201 chosen with the level shift register 203 and the perpendicular shift register 204, and outputs a signal to the signal output terminal 206. There are the forward direction terminal 207 and the KU hard flow terminal 208 which input a clock pulse into the level shift register 203, by changing the input direction of a clock pulse with a changeover switch 209, the scanning direction of the level shift register 203 is changed, and conversion of a real image and a mirror image is performed. Moreover, there are the forward direction terminal 210 and the hard flow terminal 211 which input a clock pulse into the perpendicular shift register 204, by changing the input direction of a clock pulse with a changeover switch 212, the scanning direction of the perpendicular shift register 204 is changed, and conversion of an erect image and an inverted image is performed.

[0034] Actuation of a changeover switch 209 is performed by operating the feature buttons 19 and 20 prepared in the manual operation button 9 shown in drawing 1. If the changeover switch 209 is connected to the forward direction terminal 207 as shown in drawing 16, and a real image is displayed on a liquid crystal display 7 and connected to the hard flow terminal 208, a mirror image will be displayed on a liquid crystal display 7.

[0035] Actuation of a changeover switch 212 is performed by the image changeover switch 60 being interlocked with. That is, when the video camera 22 turned to the direction of front-face of case 2a, it has stood erect, a slide member 80 contacts Conductors 78 and 79b and Conductors 78 and 79b are in switch-on, as shown in drawing 16, it connects with the forward direction terminal 210, and a changeover switch 212 outputs an erection image from the output amplifier 205. When the video camera 22 turned to the case tooth-back 2b direction on the contrary, a handstand is done, a slide member 80 contacts Conductors 78 and 79a and Conductors 78 and 79a are in switch-on, it connects with the hard flow terminal 208 side, and a changeover switch 209 outputs a handstand image from the output amplifier 205. Therefore, if a handstand image is outputted from the video camera 22 which has done a handstand, the image will turn into an erection image and will be displayed on a liquid crystal display 7.

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[Translation done.]

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] It is the appearance perspective view seen from the front face of the image pick-up equipment of the 1st example of this invention.

[Drawing 2] It is the appearance perspective view seen from the tooth back of the image pick-up equipment of the 1st example of this invention.

[Drawing 3] It is the A-A sectional view of drawing 1 .

[Drawing 4] It is the internal configuration Fig. of the image pick-up equipment of the 1st example of this invention.

[Drawing 5] It is the components perspective view of the image pick-up equipment of the 1st example of this invention.

[Drawing 6] It is the decomposition block diagram of drawing 5 .

[Drawing 7] It is the central sectional view of the rolling-mechanism section of the 1st example of this invention.

[Drawing 8] It is the changeover switch pattern Fig. of the 1st example of this invention.

[Drawing 9] It is the explanatory view of drawing 8 of operation.

[Drawing 10] It is the explanatory view of drawing 3 of operation.

[Drawing 11] It is the explanatory view of drawing 8 of operation.

[Drawing 12] It is the explanatory view of drawing 3 of operation.

[Drawing 13] It is the basic block diagram of the conventional image sensor.

[Drawing 14] It is the basic block diagram of the image sensor of the 1st example of this invention.

[Drawing 15] It is the basic block diagram of the image sensor of the 2nd example of this invention.

[Drawing 16] It is the basic block diagram of the image sensor of the 3rd example of this invention.

### [Description of Notations]

1 [ -- A liquid crystal display, 22 / -- A video camera, 33 / -- An image sensor, 36 / -- An absorber, 60 / -- An image changeover switch, 101,110 / -- A photodiode, 102,111 / -- The perpendicular transfer CCD, 104,114,119 / -- 106 The level transfer CCD 115,122,125,127 / -- Output amplifier, 124,128,130 / -- Signal changeover switch. ] -- Portable image pick-up equipment, 4 -- Rising wood, 5 -- The camera head section, 7

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[Translation done.]

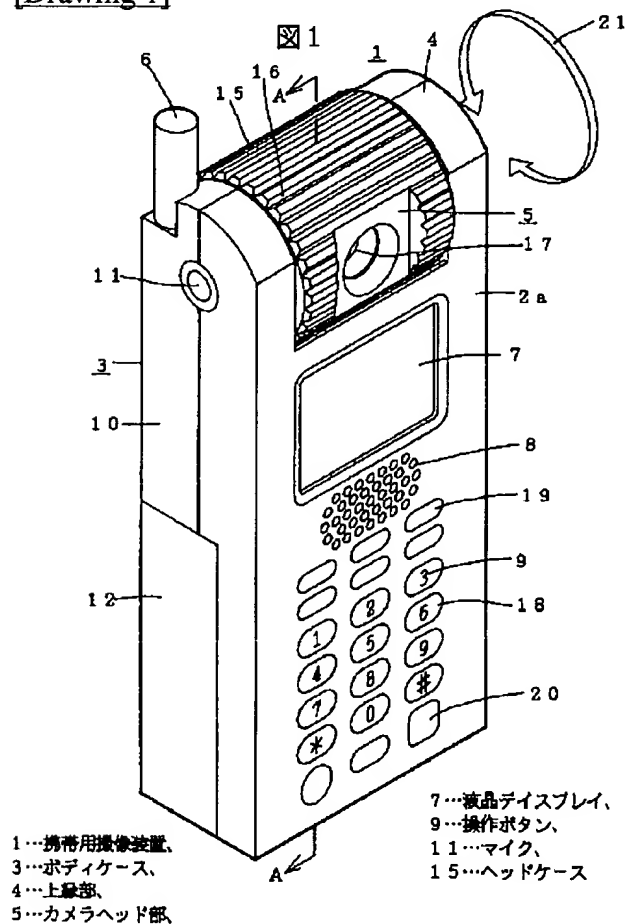
## \* NOTICES \*

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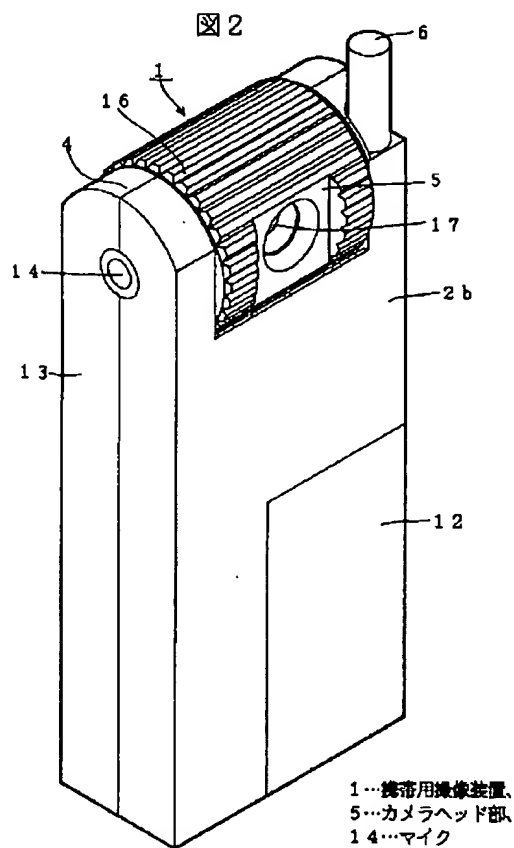
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2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

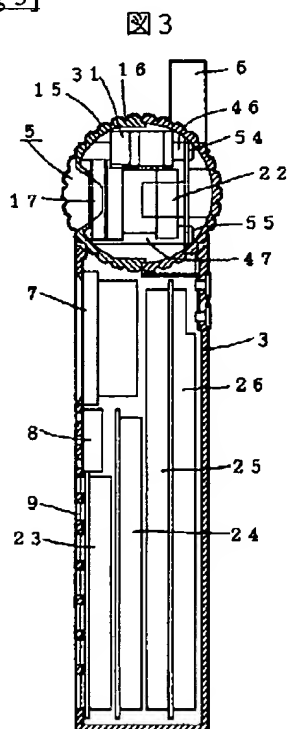
[Drawing 1]



[Drawing 2]



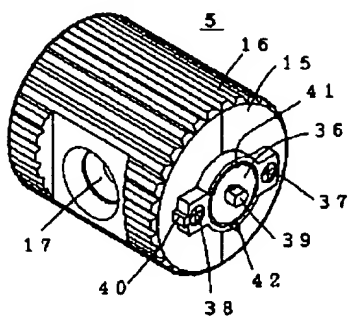
[Drawing 3]



5…カメラヘッド部、7…液晶ディスプレイ、8…スピーカ、  
9…操作ボタン、15…ヘッドケース、22…ビデオカメラ、  
23、24、25、26…基板

[Drawing 5]

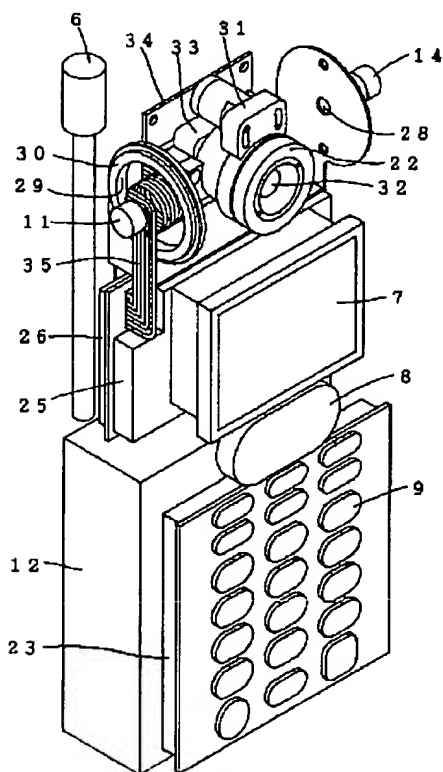
図 5



5…カメラヘッド部、15…ヘッドケース、36…ダンパー

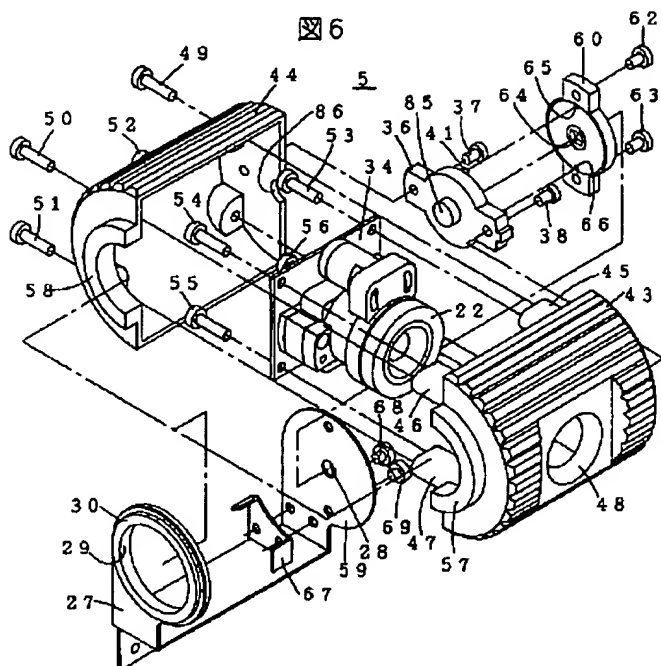
[Drawing 4]

図 4



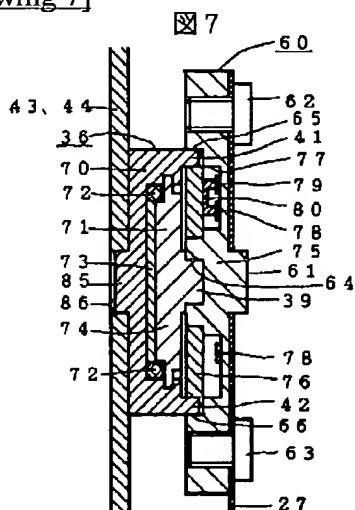
7…液晶ディスプレイ、8…スピーカ、9…操作ボタン、  
22…ビデオカメラ、23、24、25、26…基板、  
27…フレーム、35…フレキシブルケーブル

[Drawing 6]



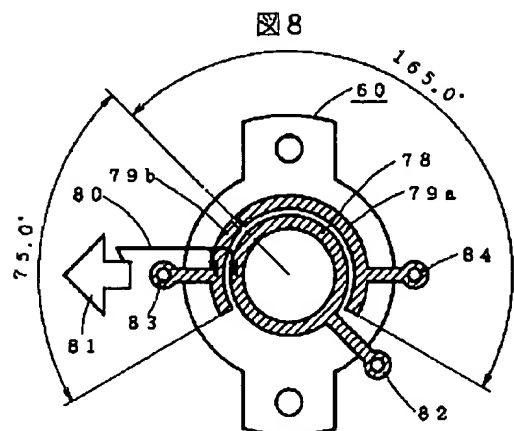
5…カメラヘッド部、22…ビデオカメラ、27…フレーム、  
30…リング、36、ダンパー、43、44…ヘッドケース、  
60…映像切り替えスイッチ、67…ストッパー

[Drawing 7]



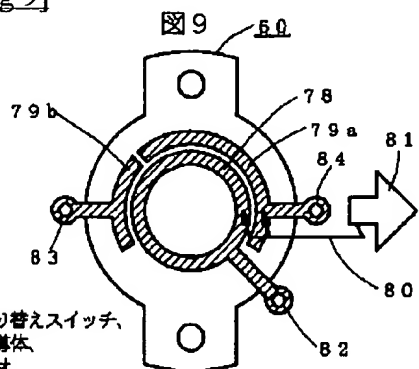
27…フレーム、36、ダンパー、43、44…ヘッドケース、  
60…映像切り替えスイッチ、70…ダンパーケース、  
71…回転部、75…切り替えスイッチケース、76…スイッチ回転部

[Drawing 8]



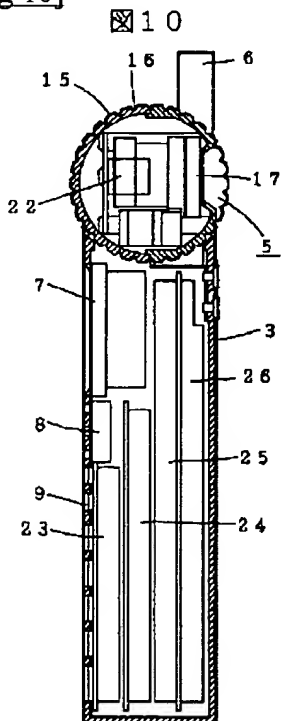
60…映像切り替えスイッチ、78, 79…導体、  
80…摺動部材、81…光軸方向

[Drawing 9]



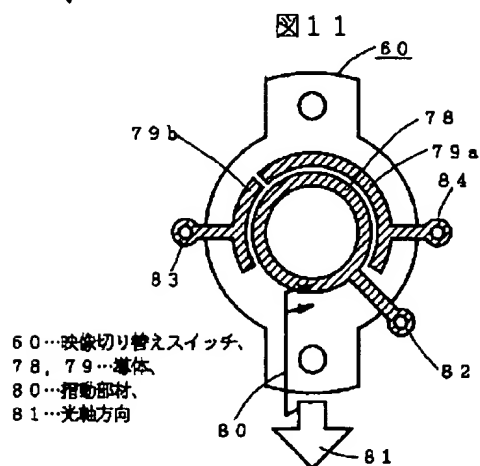
60…映像切り替えスイッチ、  
78, 79…導体、  
80…摺動部材、  
81…光軸方向

[Drawing 10]

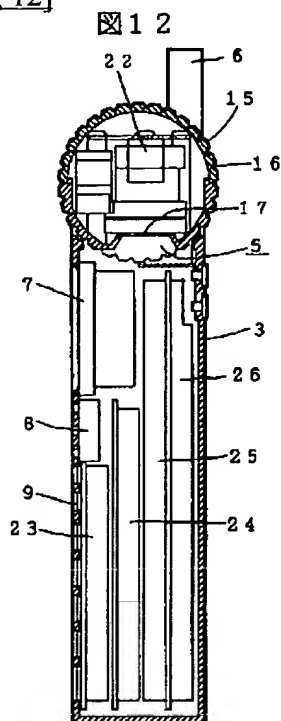


5…カメラヘッド部、7…液晶ディスプレイ、8…スピーカ、  
9…操作ボタン、15…ヘッドケース、22…ビデオカメラ、  
23, 24, 25, 26…基板

[Drawing 11]

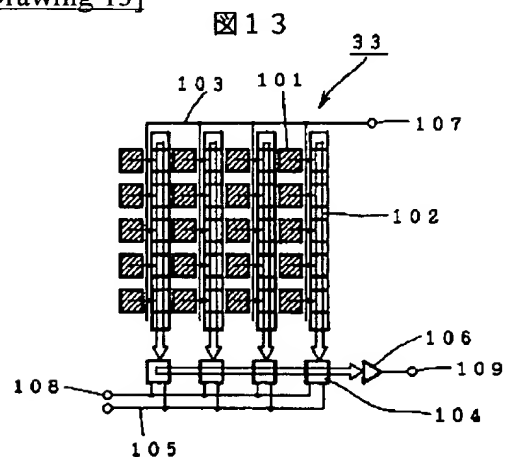


[Drawing 12]



5…カメラヘッド部、7…液晶ディスプレイ、8…スピーカ、  
9…操作ボタン、15…ヘッドケース、22…ビデオカメラ、  
23、24、25、26…基板

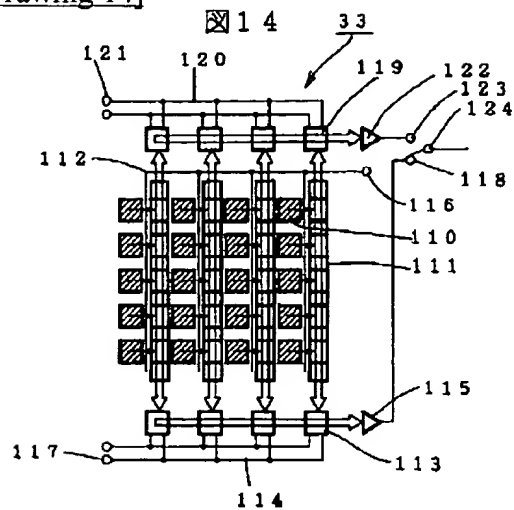
[Drawing 13]



33…撮像素子、101…フォトダイオード、102…垂直転送CCD、  
103…転送ゲート、104…水平転送CCD、106…出力アンプ

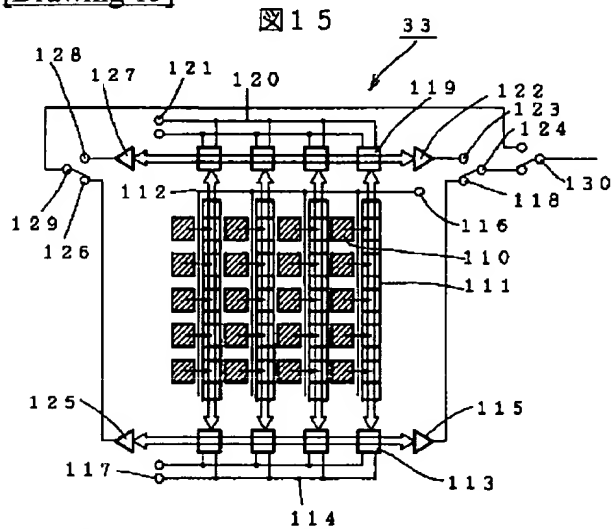


[Drawing 14]



33...撮像素子、110...フォトダイオード、115...第1の出力アンプ  
 122...第2の出力アンプ、124...第1の信号切り替えスイッチ

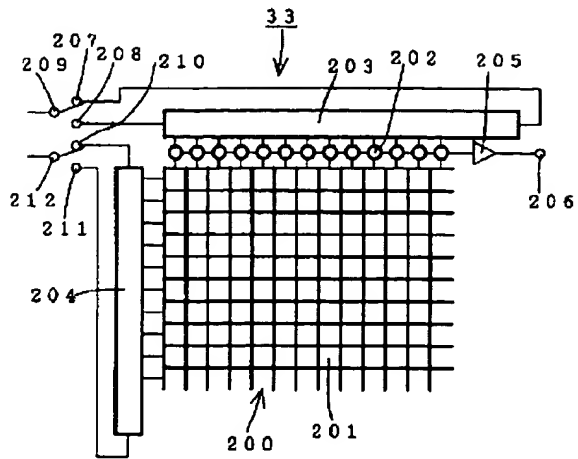
[Drawing 15]



33...撮像素子、110...フォトダイオード、115...第1の出力アンプ  
 122...第2の出力アンプ、124...第1の信号切り替えスイッチ、  
 125...第3の出力アンプ、127...第4の出力アンプ、  
 129...第2の信号切り替えスイッチ、130...第3の信号切り替えスイッチ

[Drawing 16]

图 16



33…撮像素子、201…受光ユニット、202…水平スイッチング・トランジスタ、203…水平シフト・レジスタ、204…~~垂直~~垂直シフト・レジスタ

[Translation done.]